Volume XVI.
Number 5.

MAY, 1899.

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TEXTILE WORLD,

Page. 55
23100 * apr. 11. 99.

and Industrial Record.

1899 DIRECTORY.

The Textile World's Complete Directory of the Mill Trade for 1899 (400 pp. with maps, etc.) will be published early in June. It has been completely revised. Several hundred New Mills have been added and thousands of changes have been made. The delivery to those entitled to receive it takes some time, but every paid-in-advance subscriber will receive a copy in due course. ATE !

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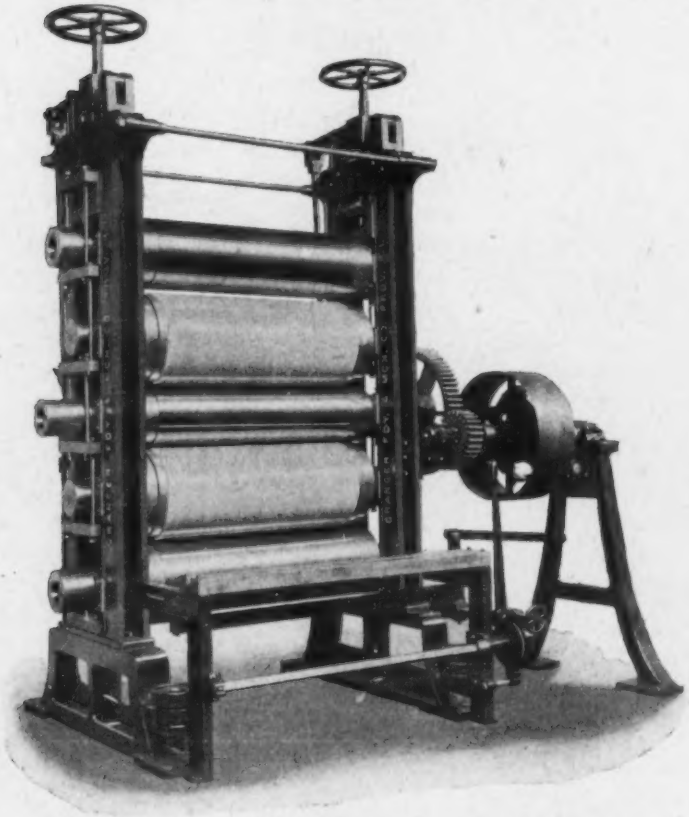
CLASSIFIED INDEX FOR BUYERS - - Page 115

GUILD & LORD,
PUBLISHERS.

620 ATLANTIC AVENUE,
BOSTON, MASS.

Bleaching, Dyeing, Drying,

And Finishing Machinery.



CALENDARS, MANGLES AND ROLLS.

TENTERING MACHINES,
MERCERIZING MACHINES.

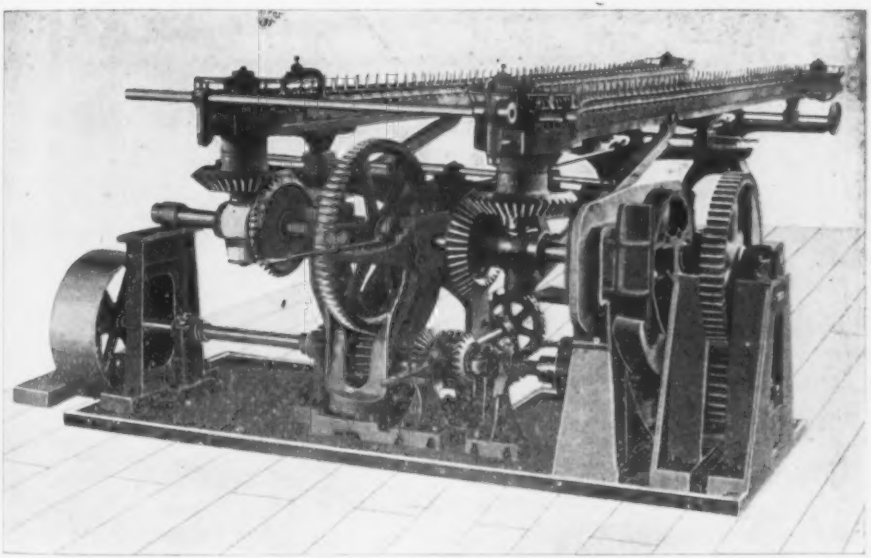
Granger Foundry and Machine Co.

PROVIVENCE, R. I.

BLEACHING, PRINTING, DYEING AND FINISHING

MACHINERY,

.... For Textile Fabrics ....



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With Patent Adjustable Cam, Patent Automatic Clamp and Patent Spur Gear Driving (short section shown.)

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PHILADELPHIA, PA.

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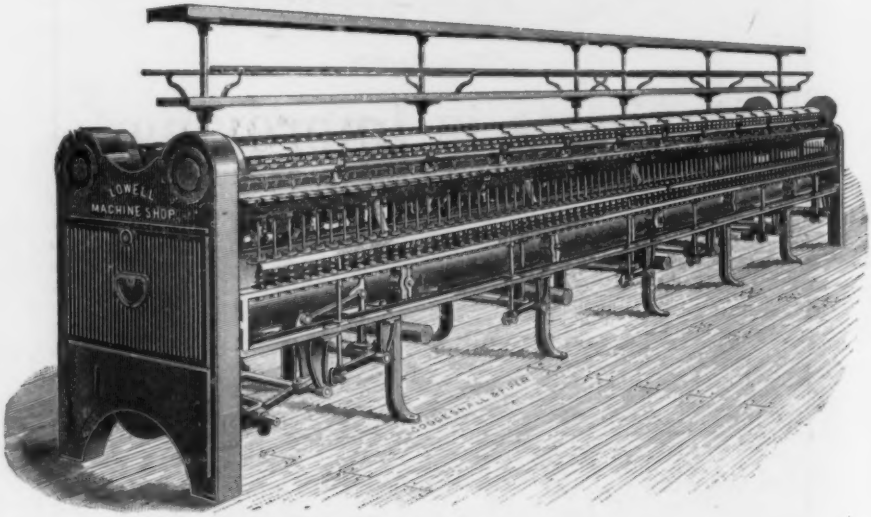
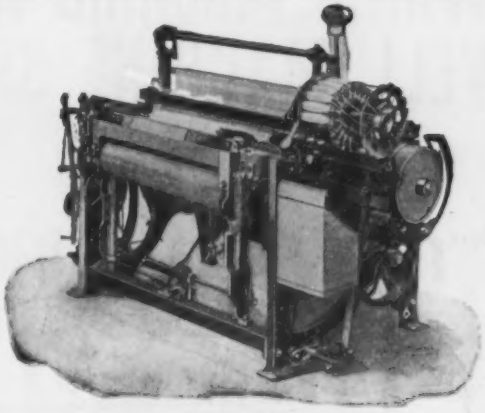
Lowell, Mass.,

COTTON MACHINERY.



Revolving Flat Cards,
Railway Heads,
Drawing Frames,
Roving Frames,
Ring Spinning Frames,
Twisters, Spoolers,
Warpers, Slashers,
Looms.

WORSTED MACHINERY.



NORTHROP LOOM.

Business is Improving.

MANY cotton mill managers will, therefore, conclude that they can possibly have a chance to run their old machinery at a profit instead of facing a daily loss.

SHOULD they fail to meet the increased demand by improving their facilities with **new machinery**, they will soon realize that the chance of a profit will bring the competition of **new mills** that will start with the latest and best equipment.

THERE is only one profitable plan—**Buy Northrop Looms.** With them the future is assured. They are no experiment. Thousands have been running for years. Sales steadily increase. The mills that refuse their opportunities will find their future utility serving as picturesque ruins in the landscape. We believe we have some honor as prophets **in our OWN country**.

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HOPEDALE, MASS.

The Whitin Machine Works,

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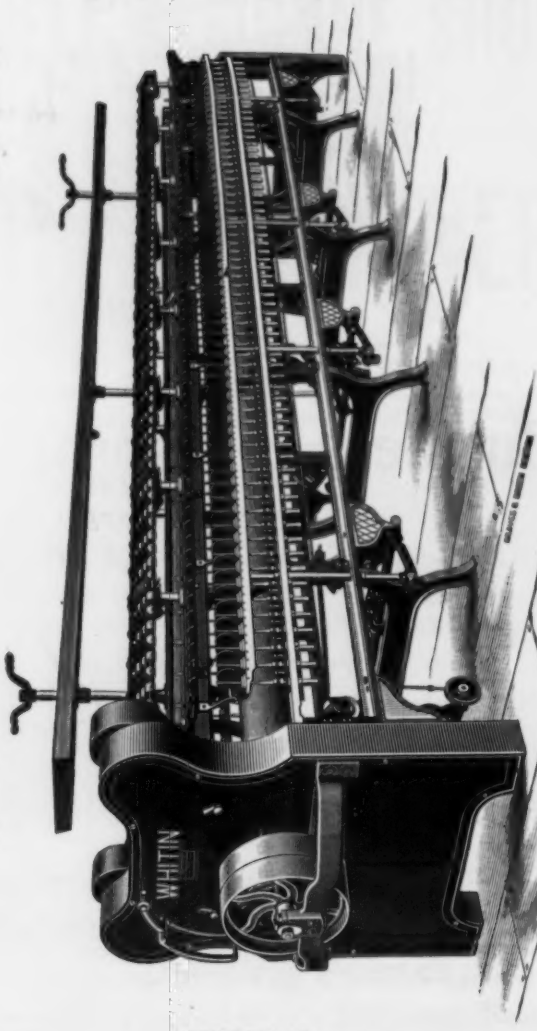
Drawing Frames,
Reels,
Spoolers.

Revolving Flat Carding Engines,
Long Chain Quilling Machines,
Wet and Dry Twisters,
Looms,



The New Whitin Ring Spinning Frame.

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S. W. CRAMER, Southern Agent.

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AMERICAN MACHINE COMPANY

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COTTON MACHINERY

Pawtucket, R.I.

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SELF-FEEDING OPENERS
BREAKER LAPPERS
INTERMEDIATE and FINISHER LAPPERS
REVOLVING FLAT CARDS
DRAWING FRAMES With Mechanical or Electric Stop Motion.
SLUBBING FRAMES
INTERMEDIATE FRAMES
ROVING FRAMES

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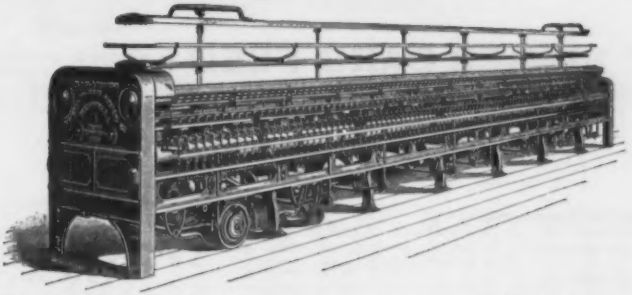

This New Pattern Spinning Frame contains many valuable improvements which will certainly interest you and pay you to investigate. All parts are specially designed and so constructed as to obtain the highest speed and greatest production.

We Invite Investigation and Comparison.

THE FISHER CARD FEED

for WOOL, SHODDY, and COTTON, is

Second to None

on the market. It holds more stock, requires less space, and needs no "attachments."

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Spinners of Worsted Yarns. Mixes and Fast Colors Specialties.
Boston Office, 570 Atlantic Avenue.

WOONSOCKET, R. I., March 4, 1896.

Messrs. Woonsocket Machine and Press Co., City,

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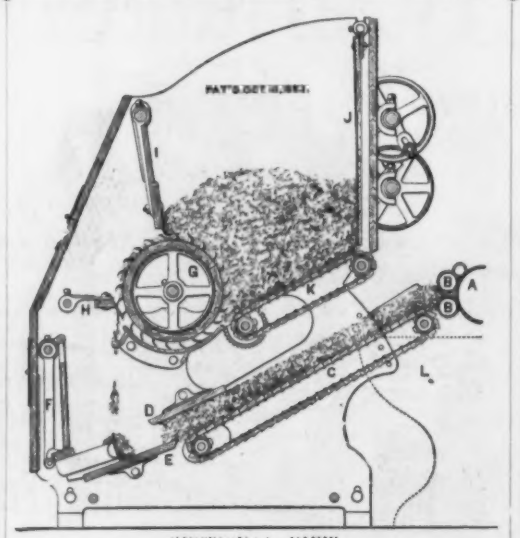
EDWIN FARNELL, Agent.



SECTIONAL VIEW.

THE FISHER CARD FEED is simple in construction, is strongly built, turns out even work, requires little changing, and feeds the same whether full or nearly empty.
It is built in all sizes and guaranteed as represented.

STAR WORSTED COMPANY,
Worsted Yarns.
C. T. Crocker, Pres. C. B. Smith, Treas.

FITCHBURG, MASS., March 4, 1896.

Woonsocket Machine and Press Co.,

GENTLEMEN—We have the pleasure to inform you that the two FISHER CARD FEEDS are working to our entire satisfaction, giving good results on both long and short wools.
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(Second order.) A. GARTH, Supt.

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COTTON MACHINERY

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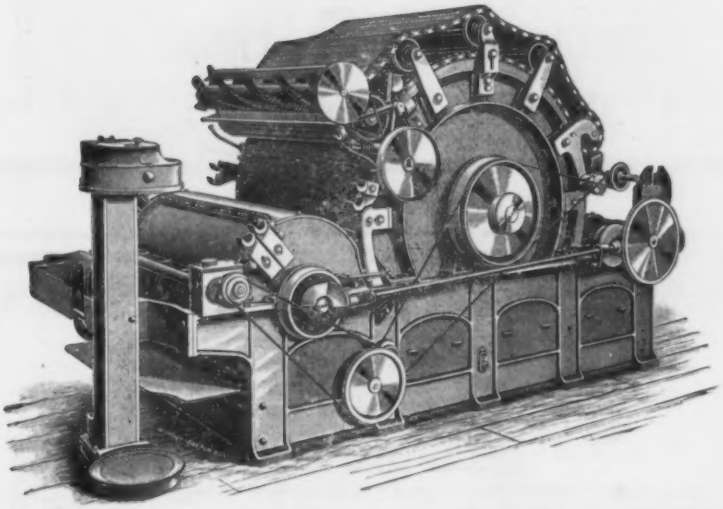

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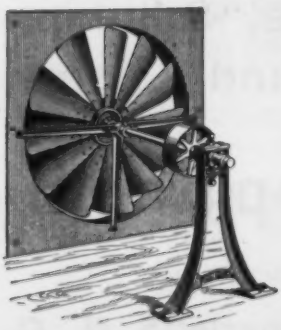

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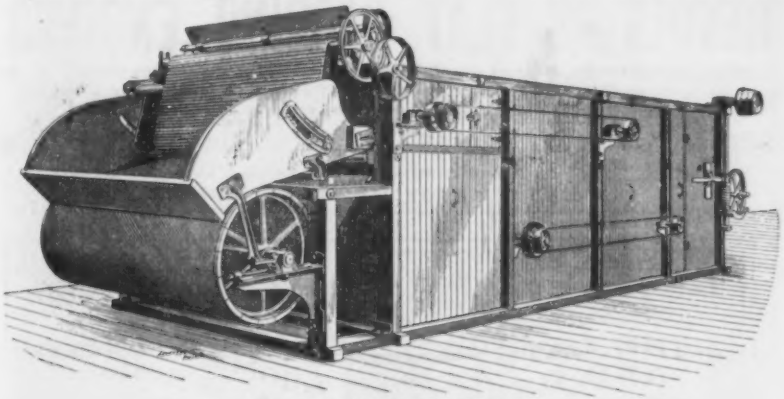

Automatic Stock Dryer.

GARNETT MACHINES,

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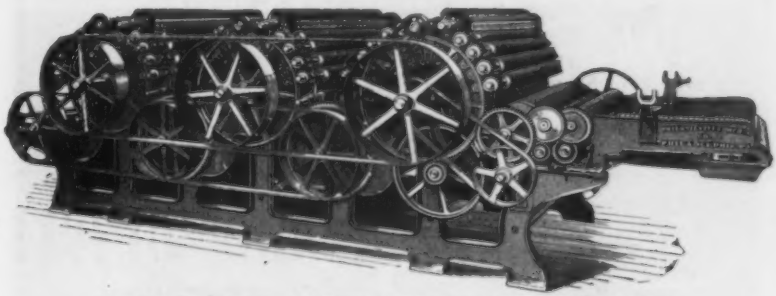
FEED ROLLS, LICKERS-IN. . . .



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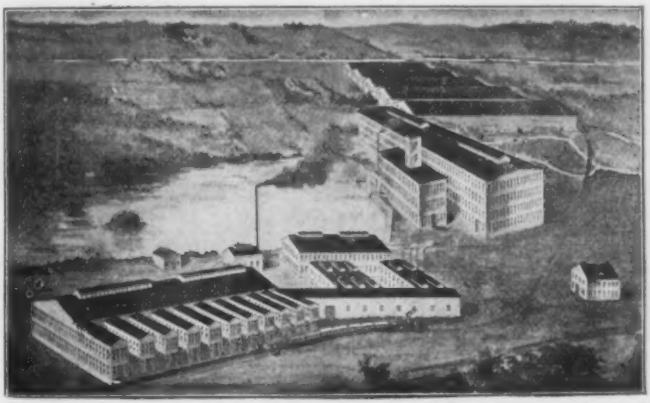

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Some of the advantages to be derived from this process are as follows:

We leave the wool in much softer and better condition than the old method of scouring, never harshing.
We save a larger percentage of the wool by preserving all the fibres.
Our process gives greater advantage in working, leaving the wool open and lofty.
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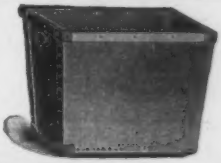
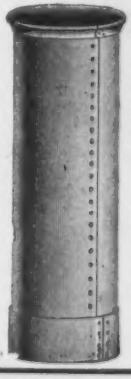
Mules, Winders, Twisters, etc., and Catch Threads when doffing. Pays for itself in six months.

Mail spindle, bobbin and sample of strongest yarn you make and we will fit one to spindle and return free of charge.





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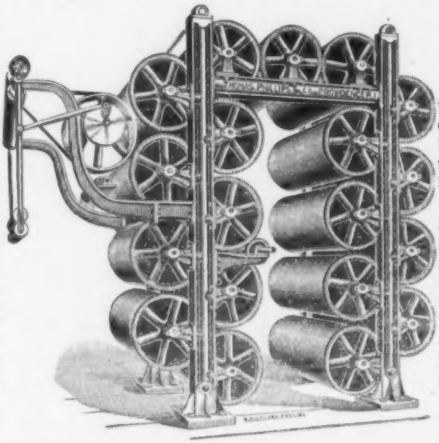
Drying and Finishing Machinery.



Phillips Upright Drying Machine.

The cut shows a 19-can machine with two tiers with intermediate can for continuous drying. We build any arrangement of stringing and furnish any desired number of cans, of any length, either with Phillips Steel Head or Cast Iron. We strongly advise our Steel Head Can. It is a big improvement as seven years' experience has demonstrated. This upright machine enables cloth to run without wide intermediate spaces between the tiers, as in horizontal machine, thus avoiding "scrimps." We also build Horizontal Frames, but on radically different principles from most others. Our illustrated catalogue explains all these points at length and has many plates showing different styles of stringing. It may be had for the asking.

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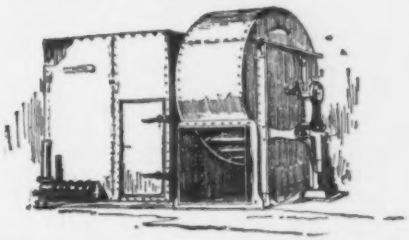

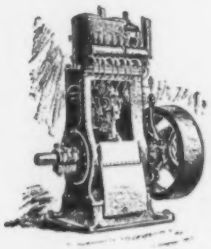

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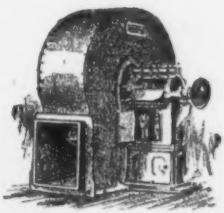
for DRYING and HANDLING RAW STOCK.

for DRYING, TENTERING and OXIDIZING PLANTS.

for Removing STEAM from DYE HOUSES, SLASHERS, DRY CANS, etc., etc.



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At 50c. per pound JENKINS '96 is not only very much cheaper, but is the best joint packing manufactured.
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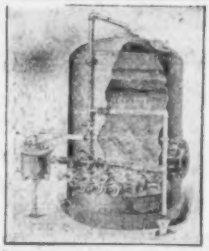

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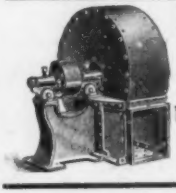
Constructed under the Jewell, Warren and Hyatt Patents.
HIGHEST EFFICIENCY LOWEST PRICE.
Patents sustained by the Highest Courts.
The acknowledged Standard of Mechanical Filtration.
O. H. JEWELL FILTER CO., 40-42 West Quincy St., CHICAGO
NEW YORK FILTER MFG. CO.,
220 Devonshire St., Boston. 26 Cortlandt St., New York.

MAGNESIA
MAGNABESTOS
ASBESTOS
STEAM PIPE COVERINGS
SOLD AND APPLIED
MINERAL WOOL
ASBESTOS PAPERS
HAIR FELT, ETC.
ROBERT A. KEASBEY,
83 Warren Street, - - - - - NEW YORK.



FANS For handling all kinds of ...DUST.
Dust Collectors and Blow Piping.
The Allington & Curtis Mfg. Co.
Saginaw, E. S. Mich.
29 Otis Street.
EAST CAMBRIDGE, MASS.

Bristol's Patent Steel Belt Lacing.

SAVES TIME, BELTS MONEY.
Greatest Strength with Least Metal.
Send for Circulars and Free Samples.
THE BRISTOL CO., - WATERBURY, CONN

A. KLIPSTEIN & CO.,
122 Pearl St.,
NEW YORK.
Dyestuffs and Chemicals.
BRANCHES:
Boston, Philadelphia, Providence, Chicago, Cincinnati, Hamilton, Ont.
See Special advertisement inside.

JOHN W. FERGUSON,
Builder and General Contractor.
Office, Paterson Nat. Bank, Paterson, N. J.
Mill Building a Specialty.
References made to some of the largest mill owners in the Middle States, including Clark Thread Co., Newark, N. J.; Barbour Flax Spinning Co., Paterson, N. J., and others.

ECONOMICAL — DURABLE — SATISFACTORY
EFFICIENT POWER PUMPS.
The Goulds Mfg. Co., SENECA FALLS N. Y.

SHAFTING BEARINGS PULLEYS CEARINGS
Link Belt Elevators & Conveyors
Largest Manufacturers in U. S.
See Advertisements on inside, front part.

Volume XVI.
Number 5.

MAY, 1899.

$2.00 Per Year,
Including Directory.
20 Cents Per Copy.

TEXTILE WORLD,

Page-55
23100 * apr. 11. '98.

and
Industrial
Record.

1899 DIRECTORY.

The Textile World's Complete Directory of the Mill Trade for 1899 (400 pp. with maps, etc.) will be published early in June. It has been completely revised. Several hundred New Mills have been added and thousands of changes have been made. The delivery to those entitled to receive it takes some time, but every paid-in-advance subscriber will receive a copy in due course.

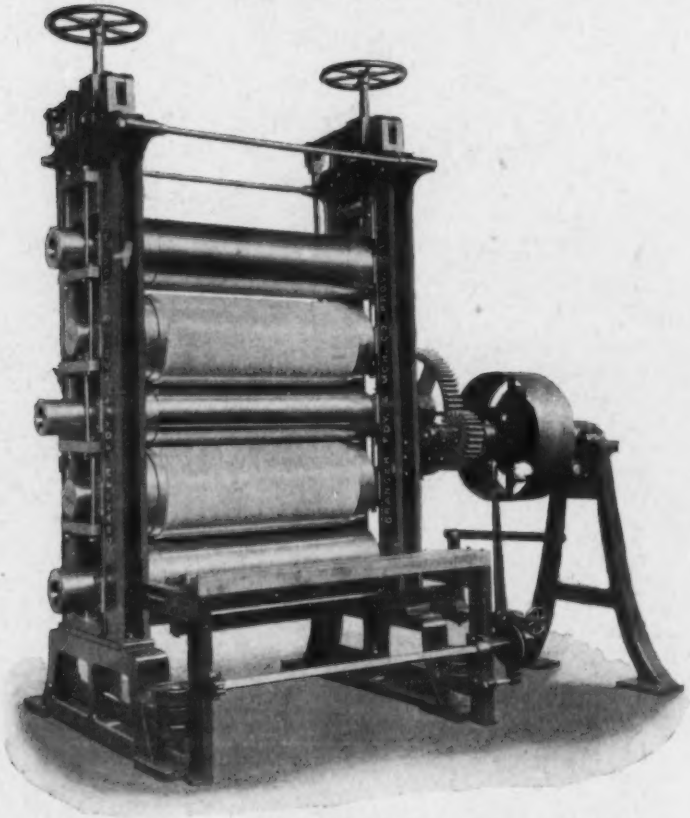
TABLE OF CONTENTS, - - - - Page 21.
CLASSIFIED INDEX FOR BUYERS - - Page 115

GUILD & LORD,
PUBLISHERS.

620 ATLANTIC AVENUE,
BOSTON, MASS.

Bleaching, Dyeing, Drying,

And Finishing Machinery.



CALENDARS, MANGLES AND ROLLS.

TENTERING MACHINES,
MERCERIZING MACHINES.

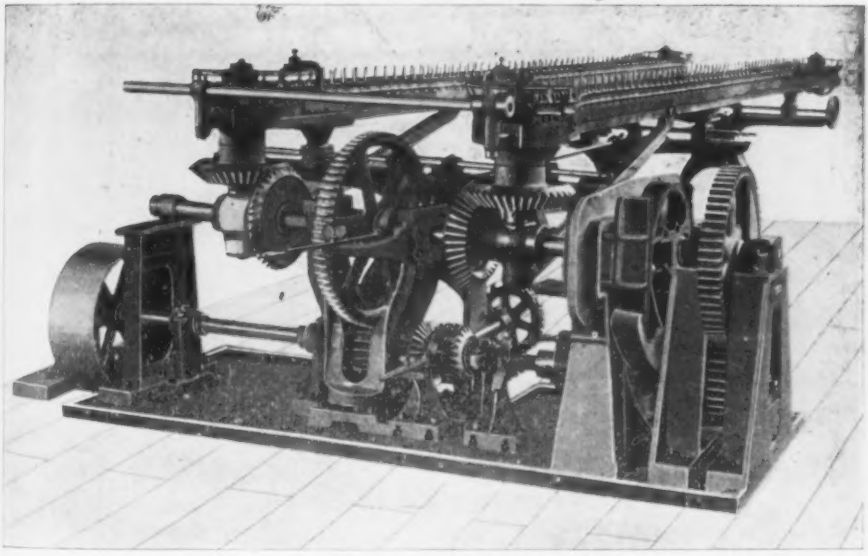
Granger Foundry and Machine Co.

PROVIVENCE, R. I.

BLEACHING, PRINTING, DYEING AND FINISHING

MACHINERY,

.... For Textile Fabrics ....



TENTERING MACHINE.

With Patent Adjustable Cam, Patent Automatic Clamp and Patent Spur Gear Driving (short section shown.)

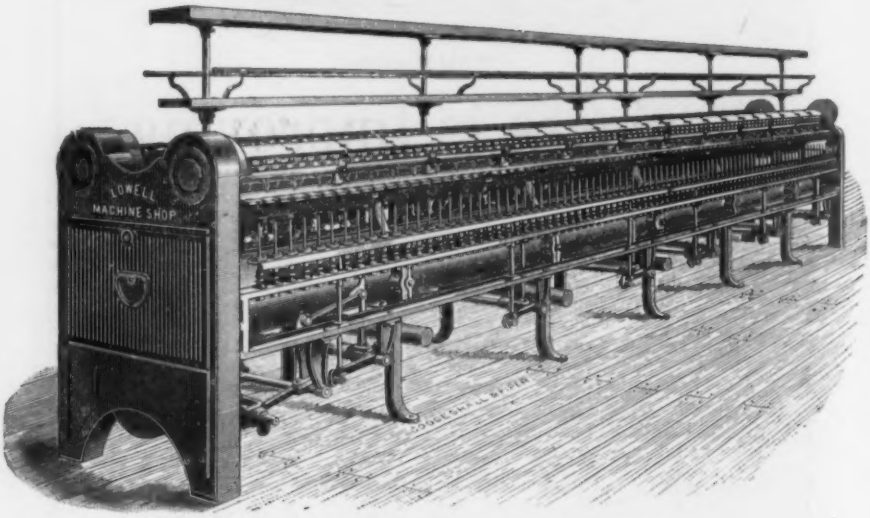
H. W. BUTTERWORTH & SONS CO.

PHILADELPHIA, PA.

LOWELL MACHINE SHOP,

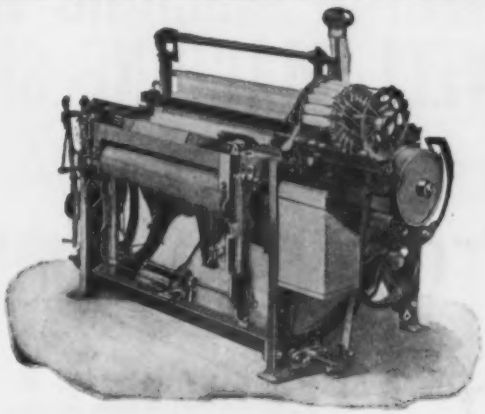
Lowell, Mass.,

COTTON MACHINERY.



Revolving Flat Cards,
Railway Heads,
Drawing Frames,
Roving Frames,
Ring Spinning Frames,
Twisters, Spoolers,
Warpers, Slashers,
Looms.

WORSTED MACHINERY.



NORTHROP LOOM.

Business is Improving.

MANY cotton mill managers will, therefore, conclude that they can possibly have a chance to run their old machinery at a profit instead of facing a daily loss.

SHOULD they fail to meet the increased demand by improving their facilities with **new machinery**, they will soon realize that the chance of a profit will bring the competition of **new mills** that will start with the latest and best equipment.

THERE is only one profitable plan—**Buy Northrop Looms.** With them the future is assured. They are no experiment. Thousands have been running for years. Sales steadily increase. The mills that refuse their opportunities will find their future utility serving as picturesque ruins in the landscape. We believe we have some honor as prophets **in our OWN country.**

WE still sell Spindles, Temples, Separators, Spinning Rings, Twisters, Warpers, Spoolers, etc., etc., etc.

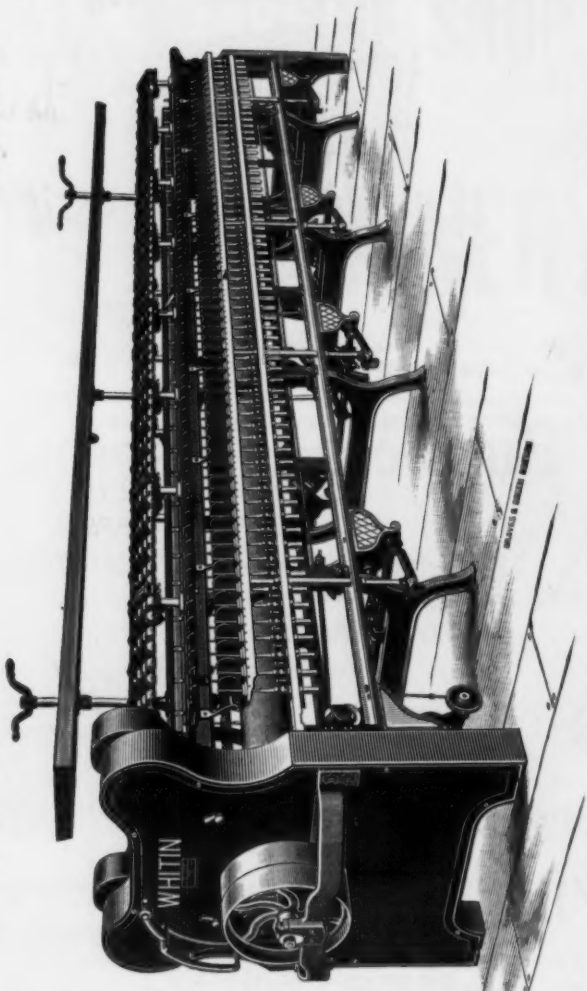
THE DRAPER COMPANY,

HOPEDALE, MASS.

The Whitin Machine Works,

Railway Heads,
Drawing Frames,
Reels,
Spoolers.

Revolving Flat Carding Engines,
Long Chain Quilling Machines,
Wet and Dry Twisters,
Looms,



The New Whitin Ring Spinning Frame.

BUILDERS OF

COTTON MACHINERY,

Whitinsville, Mass.

Southern Office: 38 So. Tryon St., Charlotte, N. C.

S. W. CRAMER, Southern Agent.

HOWARD & BULLOUGH

AMERICAN MACHINE COMPANY

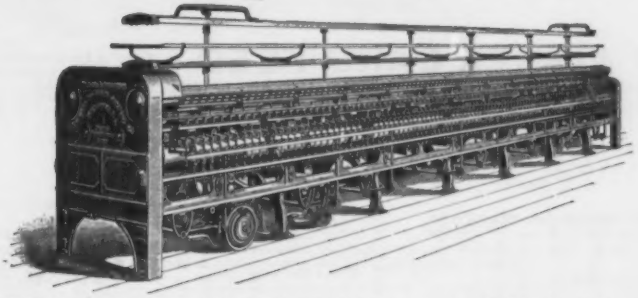
LIMITED.

COTTON MACHINERY

Pawtucket, R.I.

BALE BREAKERS and LATTICES
FEEDERS
SELF-FEEDING OPENERS
BREAKER LAPPERS
INTERMEDIATE and FINISHER LAPPERS
REVOLVING FLAT CARDS
DRAWING FRAMES With Mechanical or Electric Stop Motion.
SLUBBING FRAMES
INTERMEDIATE FRAMES
ROVING FRAMES

Improved New Pattern Spinning Frames.



This New Pattern Spinning Frame contains many valuable improvements which will certainly interest you and pay you to investigate. All parts are specially designed and so constructed as to obtain the highest speed and greatest production.

We Invite Investigation and Comparison.

THE FISHER CARD FEED

for WOOL, SHODDY, and COTTON, is

Second to None

on the market. It holds more stock, requires less space, and needs no "attachments."

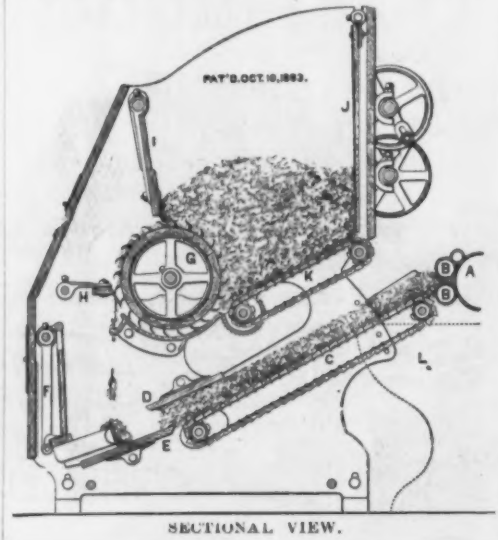
WOONSOCKET WORSTED MILLS,
Spinners of Worsted Yarns. Mixes and Fast Colors Specialties.
Boston Office, 570 Atlantic Avenue.

WOONSOCKET, R. I., March 4, 1896.

Messrs. Woonsocket Machine and Press Co., City,

GENTLEMEN—In answer to your inquiry of to day as to how we like the FISHER FEEDS would say that, after running one for three months and having put in four more since, is sufficient evidence that we consider the Fisher Feeds the best in the market to-day, and you are at liberty to bring any interested person into our mill to see them running and judge for themselves. Yours truly,

WOONSOCKET WORSTED MILLS,
EDWIN FARNELL, Agent.



SECTIONAL VIEW.

THE FISHER CARD FEED is simple in construction, is strongly built, turns out even work, requires little changing, and feeds the same whether full or nearly empty.

It is built in all sizes and guaranteed as represented.

STAR WORSTED COMPANY,
Worsted Yarns.
C. T. Crocker, Pres. C. B. Smith, Treas.

FITCHBURG, MASS., March 4, 1896.

Woonsocket Machine and Press Co.,

GENTLEMEN—We have the pleasure to inform you that the two FISHER CARD FEEDS are working to our entire satisfaction, giving good results on both long and short wools.

Yours respectfully, STAR WORSTED COMPANY,
(Second order.) A. GARTH, Supt.

MANUFACTURED BY

Woonsocket Machine and Press Co.,

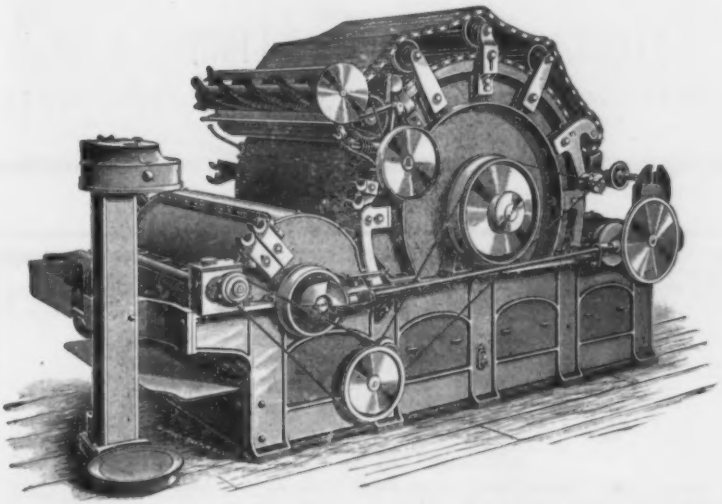
WOONSOCKET, R. I.

MASON MACHINE WORKS,

TAUNTON, MASS.

COTTON MACHINERY

REVOLVING FLAT CARD.



Cards, Combers, Railway Heads, Drawing Frames, Spinning Frames, Mules and Looms,

INCLUDING THE

Mason-Northrop Loom.

SOUTHERN AGENCY:

D. A. TOMPKINS CO., Charlotte, N. C.

WORSTED MACHINERY.

STODDARD, HASERICK, RICHARDS & CO.,

BRADFORD, ENG. BOSTON, MASS.

Cohoes Foundry and Machine Co.

BUILDERS OF

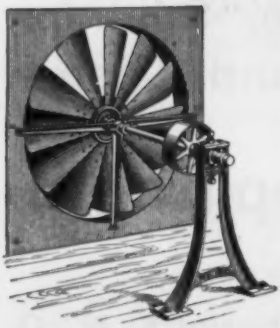
SLASHERS,

ELEVATORS,

WATER WHEEL GOVERNORS, SHELL ROLLS.

General Foundry and Machine Work, Repairing

COHOES, NEW YORK.



Hurricane Dryers

For Cotton Stock, Wool, Yarn, Etc.

CARBONIZERS,

HURRICANE FANS

BEST in Construction, LOWEST in Price.

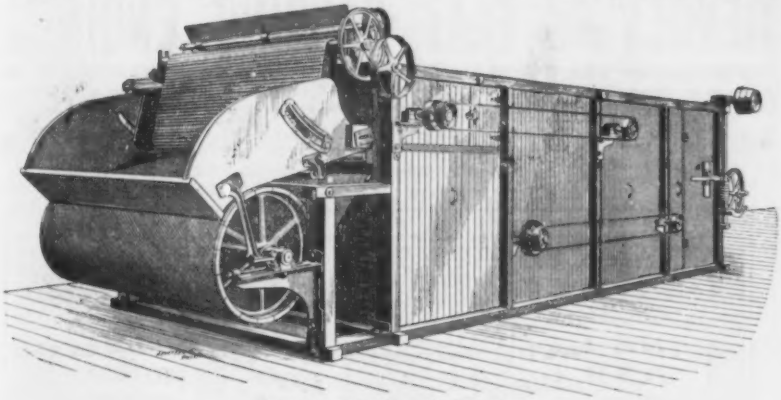
Phila. Drying Machinery Co.,

6721 Germantown Avenue, Philadelphia, Pa.

CYCLONE DRYERS

For WOOL, COTTON STOCK, YARN,
UNDERWEAR, STOCKINGS. : :

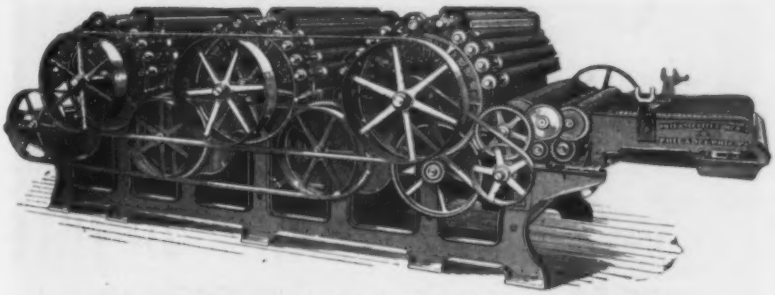
Carbonizing Machines. Yarn Scourers.



Automatic Stock Dryer.

GARNETT MACHINES,

BREASTS, BURRING MACHINES,
FEED ROLLS, LICKERS-IN. . . .



Proctor Improved Double Fancy Garnett Machine.

PHILADELPHIA TEXTILE MACHINERY CO.,

Hancock and Somerset Sts.,

PHILADELPHIA, - - - PA.

ANYTHING

Entire Outfits for New Mills, or small and odd items that you don't know just where to obtain, can be found at the

AMERICAN SUPPLY CO.
PROVIDENCE, R. I.

in Mill Supplies.

PLATT BROS. & CO.'S
REVOLVING FLAT CARDING ENGINES,

"1894" pattern with Patent Flexible Bend with slots for direct setting of the flats to the cylinder by the gauge, and McConnell & Higginson's Patent Grinding Apparatus for grinding the flats from their working surfaces.

Sykes' Hardened and Tempered Plow Ground Polished Steel Wire Card Clothing.

EVAN ARTHUR LEIGH, Successor to E. A. Leigh & Co., (Sole Agent),
35 and 36 MASON BUILDING, BOSTON.

FAIRMOUNT MACHINE CO.

22ND & WOOD STS.
PHILADELPHIA.

THE LATEST AND BEST LOOMS, DOBBIES, HARNESS MOTIONS

BEAMING, SPOOLING, WINDING, DYEING AND SIZING MACHINERY.

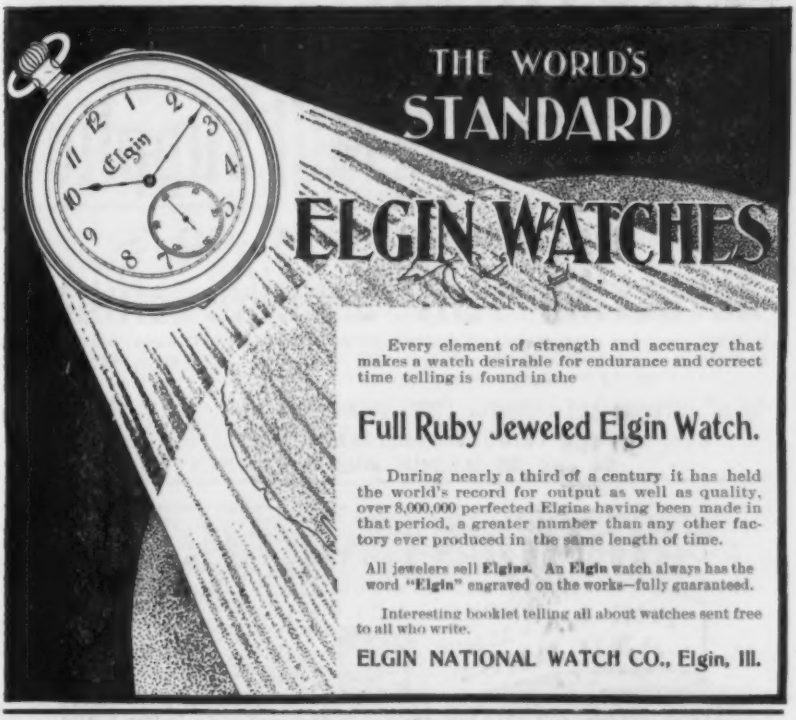
POWER TRANSMITTING MACHINERY.
FREIGHT ELEVATORS, PATENT FRICTION CLUTCHES.

WHITINSVILLE SPINNING RING CO.
ESTABLISHED 1873.
WHITINSVILLE, MASS. U.S.A.
OUR PATENTED SPECIALTIES.
DOUBLE RIBBED RINGS U.S. STANDARD. TRAVELER CLEARERS. METALIC BURNISH LIKE THAT PRODUCED BY TRAVELER.

JACOB WALDER, - Paterson, N. J.
Sole Manufacturer in United States of

BRASS AND STEEL MAILS

Liberal Discount to Dealers.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STANDARD
ELGIN WATCHES
Elgin
Every element of strength and accuracy that makes a watch desirable for endurance and correct time telling is found in the
Full Ruby Jeweled Elgin Watch.
During nearly a third of a century it has held the world's record for output as well as quality, over 8,000,000 perfected Elgins having been made in that period, a greater number than any other factory ever produced in the same length of time.
All jewelers sell Elgins. An Elgin watch always has the word "Elgin" engraved on the works—fully guaranteed.
Interesting booklet telling all about watches sent free to all who write.
ELGIN NATIONAL WATCH CO., Elgin, Ill.

KILBURN, LINCOLN & CO.,

FALL RIVER, MASS.

MAKERS OF LOOMS FOR COTTON AND SILK WEAVING.

The new Arkwright Mill in Fall River is fitted out with 1100 of our **Heavy Pattern Looms**, especially adapted to run at high speed.

We are now building our **New High Speed Loom** with the **Northrop** continuous-filling and warp-stop motions attached.

We Build Looms for Weaving all Grades of Goods.

ELLIOT CLOTH FOLDER AND MEASURER

For Cotton and Gingham Mills, Bleacheries, Print Works, Etc.

MANUFACTURED BY

ELLIOT & HALL,

54 1-2 Harman St., Worcester, Mass. Send for Circular

ESTABLISHED 1865.

W. W. ALTEMUS & SON,

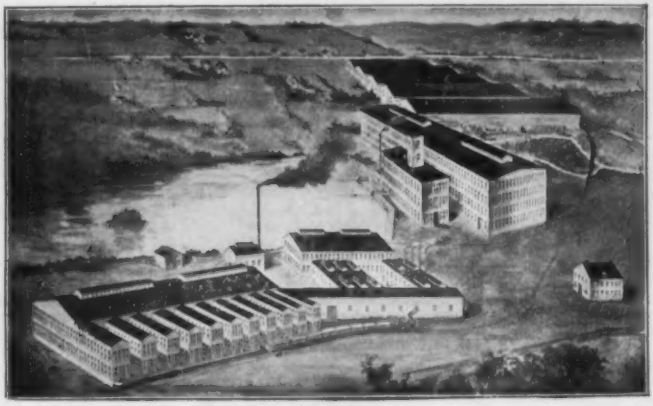
Patent Bobbin and Cop Winders, Spoolers, Beamers, Warp Mills, Chenille Cutting, Carpet Rolling Machines, Reels, Etc.

2816 N. 4th Street, - PHILADELPHIA, PA

Southern Agents, SEXTON & ROBBINS CO., Charlotte, N. C.

The New Morse System For Cleansing Wool.

THE practical success of this system of cleaning wool has now been demonstrated beyond question; and the extensive works at Norton, Mass., are now prepared to handle large quantities of wool for manufacturers and the trade.



Morse Wool Treating Works at Norton, Mass.

Some of the advantages to be derived from this process are as follows:

We leave the wool in much softer and better condition than the old method of scouring, never harshing.
We save a larger percentage of the wool by preserving all the fibres.
Our process gives greater advantage in working, leaving the wool open and lofty.
Superior advantages in dyeing.
We save all of the nerve of the wool, which is of great advantage in carding, drawing and spinning, and of great benefit in finishing.
We have shown a saving of 3% in noiling and 5% through works.
We use no soaps or soda ash.
We have demonstrated all of the above facts.

We can do the work at a saving to the manufacturer, adding nothing to the cost.

If desired can be treated in the original package, and returned without disturbing the bale, fleece, or pelt.

WE INVITE CORRESPONDENCE.

MORSE WOOL TREATING CO.,

New York Office, 20 Nassau St. Station A, Norton, Mass.

There is an apparent discrepancy at this point.

The pages are either missing or the pagination is incorrect.

The filming is recorded as the book is found in the collections.

LINK-BELT

ELEVATORS and CONVEYORS

for handling Cotton Bales Rolls, Bundles, Packages, Coal, Ashes, etc.

SHAFTING, PULLEYS

BEARINGS, CLUTCHES, GEARING,

Ropesheaves, Etc.

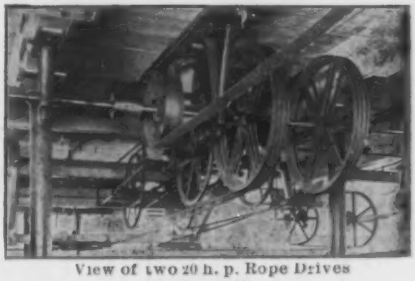
Catalogue on Application.

LINK-BELT MACHINERY CO.,

Engineers, Founders, Machinists,

CHICAGO, U. S. A.

NEW ORLEANS, 710 Union St.



View of two 20 h. p. Rope Drives in yarn mill of W. H. GRUNDY & CO., Bristol, Pa.

LINK-BELT ENGINEERING CO., PHILA. AND NEW YORK.

SPINDLES

Also FLYERS, STEEL CAPS, BOLSTERS, STEPS, TUBES, Etc.

For Cotton, Woolen, Worsted, Silk, and Flax Machinery.

MANUFACTURERS AND REPAIRERS.

WARD & VANDECRIFT,

Formerly with Bridesburg Mfg. Co.

Elmer, Salem Co., N. J.

WATSON'S

HEDDLE FRAMES.
WIRE HEDDLES.
TEMPERED STEEL WIRE
STRIPPER CARDS.

ADDRESS L. S. WATSON MFG. CO., LEICESTER, MASS., FOR THE VERY BEST MADE

ELIJAH ASHWORTH,

MANUFACTURER OF

Card Clothing of Every Description

FALL RIVER, MASS. HENRY ASHWORTH, Agent.

PARIS. BERLIN. LONDON.

EUROPEAN PATTERN SUPPLY CO.

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Largest assortment, being continually added to, of latest European Novelties, in Designs for Men's Woolens and Cloakings.

Subscription $80.00 Per Annum. Single Patterns According to their Value.

TO AVOID LOSS

NEVER SEND MONEY
IN LETTERS, BY MAIL.

ALWAYS

GET AN AMERICAN EXPRESS MONEY ORDER.

RATES LOWER AND SYSTEM SAFER THAN ANY OTHER METHOD.

DO NOT **CARRY MONEY WHEN TRAVELING.**

IT IS ENTIRELY UNNECESSARY IF YOU TAKE

THE **TRAVELERS CHEQUES**

OF THE **AMERICAN EXPRESS COMPANY.**

The Standard of all Transmission Ropes.

Has been Tested by the Largest Users in the Country.

AJAX runs the longest and largest drive in the world at Pensacola, Florida.

AJAX drives the new mammoth grain elevator, in Manchester, England.

AJAX drives the great machinery of the Illinois Steel Company.

USE AJAX AND RUN NO RISK OF ACCIDENT.

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Textile School

Thoroughly practical instruction given on

New Machinery in Every Branch of

Textile Manufacturing.

The most complete Textile School in America.

Send for Catalogue to

WM. W. CROSBY, Principal.

LOWELL, MASS.

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TEXTILE SCHOOL.

FIFTEENTH YEAR.

Instruction given in all branches of the manufacture of

Cotton, Wool and Silk.

Complete modern equipment for

Carding, Spinning, Dyeing, Weaving and Finishing.

—1898.—

Day classes open October 2d, 1899; Evening Classes open Oct. 9th, 1899.

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Send for illustrated year book.

E. W. FRANCE, Director,

BROAD AND PINE STS., PHILADELPHIA.

JAMES H. QUILTER,

Certified Teacher of Frame-Work Knitting. City and Guild, of London Institute, England.

Information given on all subjects relating to the manufacture and finishing of Hosiery and Hosiery Fabrics.

Estimates given for all kinds of machinery used in the knitting and allied trades.

Editor and Sole Proprietor of the

KNITTERS CIRCULAR

AND MONTHLY RECORD.

The only British journal solely devoted to the interest of the hosiery trade.

Annual Subscription, post free, 50 cts.

Send for sample copy.

ADDRESS:

11 Millstone Lane, LEICESTER, England.

INSTRUCTION BY MAIL

in Yarn Preparation, Cloth Manufacture, Designing and

MILL CALCULATIONS.

Send for Free Catalogue to Department C.

AMERICAN CORRESPONDENCE SCHOOL OF TEXTILES.

New Bedford, Mass.

C. P. BROOKS, Director.

BIRCH BROS.,

Somerville, Mass.

Mill Sewing Machines.

Sews any fabric, wet or dry, thin or thick, fine stitch or coarse stitch.

SEND FOR CATALOGUE.

Bleaching, Dyeing and Finishing Machinery.

Burr Bobbin Holder & Thread Catcher Co.

86 Pratt St., HARTFORD, CONN.

makes a device to

HOLD BOBBINS FIRM

on

Mules, Winders, Twisters, etc., and **Catch Threads** when doffing. **Pays for itself in six months.**

Mail spindle, bobbin and sample of strongest yarn you make and we will fit one to spindle and return free of charge.

Hahn's Latest Improved **Watchman's Time Detector.**

This clock is adapted to 6, 12 or 18 stations and the keys are all different A liberal allowance made for old detectors. For circulars, prices and further information address,

NANZ & CO., 116A Chambers Street, New York.

FINISHING MACHINERY for Brushing, Calendering, Drying, Dyeing, Pulling, Lapping, Rolling, Folding, Measuring, Pressing, Steaming, Shearing, Singeing. Blades, Spirals, Brushes furnished or repaired; Wire Looms, Forming Press for Febrille Goods, Metals or Hats. Perforating, Plate Printing, Engraving Machines. Paper Mill, Box Printers and Binders Machines.
GEO. C. HOWARD, 1783 Barker St., Phila., Pa.

APPLETON & DANA,

U. S. Mgrs. and Attys.

BOSTON, . MASS.

SAFE AND RELIABLE.

EMPLOYERS' LIABILITY INSURANCE

—AT—

Conservative Rates.

APPLETON & DANA,

New England General Agents.

71 Kilby Street, - BOSTON.

TEXTILE MACHINE WORKS,

THUN & JANSSEN, Reading, Pa.

Manufacturers of

BRAIDING MACHINES OF SUPERIOR QUALITY

for making Dress Trimming Braids, Cotton Tapes, Underwear Braids, Shoe Laces, Spindle Banding, etc. Winders, **Doublers,** Measuring Machines, Reelers, Singeing and Finishing Machinery. Special machinery.

COMB CIRCLES

Fallers and Gills,

and all kinds of GILL COMB and CARD PINS, and PICKER TEETH.

PRICES REDUCED.

WILLIAM CRABB & CO., Newark, N. J.

Lowest prices without detracting from the quality. All we ask is for requests for special prices.

Nashua Spool and Bobbin Co.,

NASHUA, N. H.

Manufacturers of BOBBINS, SKEWERS, SPOOLS AND SHUTTLES of every description.

FRIEDBERGER'S
EDGINGS and BRAIDS

For Spring, 1899, have proved

An Unbounded Success.

Our line embraces Designs and Effects that cannot be duplicated elsewhere, and are

Superior To All Other Makes.

The Same is True of our

Spring 1900 Line

Which has been in active preparation the past twelve months,

Embracing Effects Never Before Attempted in Edgings,

Which will be shown by our Traveling Salesman, April 15th.

WEEKLY OUTPUT - - - - - 3,000,000 YARDS.

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ILLINOIS ELECTRIC CO., 239 Madison St., CHICAGO.
AUSTIN ELECTRIC SUPPLY, AUSTIN, TEX.
PHŒNIX ELECTRIC CO., Norfolk, Va.,
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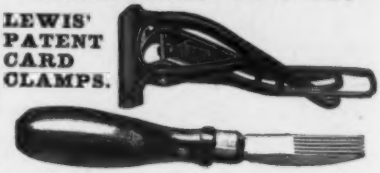

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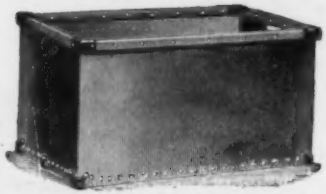

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Special quarterly issues are published in January, April, July and October; one (January) being a statistical issue, and the others devoted especially to the cotton, knitting and woolen branches, respectively.

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List of Textile Patents.

Issued March 28, and April 4, 11, and 18, 1899.

Alarm Attachment for Power Looms. 622,498. Christian Kramer, New York, N. Y., assignor of one-half to Charles Wirtz, same place.

Carding Engine. 623,094. Charles Mills and Loren W. Penney, Newton, Mass., assignors to the Pettee Machine Works, same place.

Carding Engines, Apparatus for Grinding Flats for Rotary. 623,095. Charles Mills, Newton, Mass., assignor to the Pettee Machine Works, same place.

Carding Engine Flat. 622,567. Robert W. Hunton, Newton, Mass., assignor to the Pettee Machine Works, same place.

Card Setting Machine Guide. 621,988. Elijah Ashworth, Manchester, England.

Compressing and Baling Apparatus. 622,161. Warren A. Patterson, Houston, Tex.

Cotton, Device for Measuring Fibre Length of. 622,725. William E. Stainback, Memphis, Tenn.

Cotton Press. 623,020. Edmun M. Ivens, New Orleans, La.

Embroidery Frame. 623,301. Nilsson Allen, Griggsville, Ill.

Fibrous Materials, Apparatus for Cleaning, Combing and Assorting. 622,031. William S. Archer, New York, N. Y.

Flexible Skin or Fabric. 622,727. John H. Stevens, Newark, N. J., assignor to the Celluloid Co., New York, N. Y., a corporation of New Jersey.

Jacquard Machine. Open Shed. 621,949. George W. Stafford and Albert E. Kelmel, Providence, R. I., assignors to the Crompton and Knowles Loom Works, Worcester, Mass.

Jacquard Reeding and Punching Apparatus. 623,473. Henry Hill, Nottingham, England.

Knitting Machine. 622,542. George W. Ruth, Norristown, Pa.

Loom. 622,810. Wm. P. Kirkpatrick, Arrowsmith, Ill.

Loom. 623,092. John T. Meats, Taunton, Mass., assignor to the Mason Machine Works, same place.

Loom. 623,114. Horace Wyman, Worcester, Mass., assignor to the Crompton & Knowles Loom Works, same place.

Loom Jacquard Mechanism. 622,257. Giuseppe Pavia, Paterson, N. J., assignor to James Jackson & Sons, same place.

Loom Pick Finding Mechanism. 622,650. Charles A. Littlefield, Lowell, Mass., assignor to the Draper Company, Portland, Me., and Hopedale, Mass.

Loom Picking Device. 622,485. Leopold Jacques and Ludger Painchaud, Salem, Mass.

Loom Reed. 623,196. Byron Wood, Danielson, Conn.

Loom Stopping Mechanism. 623,174. James H. Northrop, Hopedale, Mass., assignor to the Draper Company, same place and Portland, Me.

Loom Warp Stop Mechanism. 622,630. James H. Northrop, Hopedale, Mass., assignor to the Draper Company, same place and Portland, Me.

Loom Warp Stop Motion. 622,462. Johann A. Graf, Manchester, N. H.

Ring Spinning Machine. 622,181. George O. Draper, Hopedale, Mass., assignor to the Draper Company, same place and Portland, Me.

Ring Spinning Machine. 622,180. George O. Draper, Hopedale, Mass., assignor to the Draper Company, same place and Portland, Me.

Shoddy Making Machine. 623,176. Edward S. Parks, Danbury, Conn., assignor to C. D. Parks, same place.

Spinning Frame. 622,104. Simeon Berard, Fall River, Mass

Spinning Machine. 622,836 Edmund K. Baker, Springfield, Mass.

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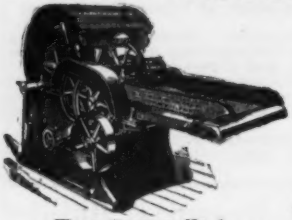

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Spinning or Twisting Frame. 622,649. George W. Knight and Howard W. Bracken, Hopedale, Mass., assignors to the Draper Company, same place, and Portland, Me.

Tubular Fabric, Machine for Turning and Cutting. 622,741. Franklin A. Weller, Philmont, N. Y., assignor of one-half to John Histon, same place.

Tufted Fabrics, Machine for Making. 622,901. Christian S. E. Spoerl, Scranton, Pa.

Warp Stop Motion Apparatus. 622,183. George O. Draper, Hopedale, Mass., assignor to the Draper Company, same place and Portland, Me.

Warp Stop Motion Apparatus. 622,182. George O. Draper, Hopedale, Mass., assignor to the Draper Company, same place and Portland, Me.

Warp Stop Motion Apparatus. 622,184. George O. Draper, Hopedale, Mass., assignor to the Draper Company, same place and Portland, Me.

Warp Threads, Machine for Drawing In. 622,154. Joseph Joubert, Doizieu, France, assignor to the Machine Factory, Ruti, formerly Casper Honegger, Ruti, Switzerland.

Winding Machine. 622,103. Simeon Berard, Fall River, Mass.

Woven Fabric. 622,237. James E. Kerr, Philadelphia, Penn.

Yarn Treating Apparatus. 622,001. John Gregson, Fall River, Mass

—At the close of the 17th century, the art of tissue printing became a large industry in Germany, and much competition was the result, with a consequence that the number of printers at Augsbourg had to be limited to four Protestants and four Catholics, afterwards increased to eight of each.

—Hawaii, with its eight islands, in area about equal to New Jersey, though containing only a handful of people, a little in excess of 109,000, must not be left out of consideration in discussing increased outlets for our cotton products.

—With every year that goes by the importance of accurate data regarding the commerce of the country is being more and more recognized by people generally.

—The Philippines have not only a steadily maintained credit, but a growing one; and this growth has taken place in the face of a foreign rule discouraging to production.

H. E. WALMSLEY.

TEXTILE WORLD.

Vol. XVI. MAY, 1899. No. 5.

HERBERT E. WALMSLEY.

The well-known subject of this notice was born in England some forty-five years ago, and has had a most unique, varied, and extensive experience of mill life covering a period of thirty years.

Mr. Walmsley's father—as was his grandfather—is by profession a physician, and a leading public man in his native city, Manchester, England. Mr. Walmsley entered the mill at the age of 15 or 16 and served his apprenticeship in Lancashire, the great cotton manufacturing centre of the world. At the age of twenty-two he received an appointment as mill manager in Russia, in which country he remained for eleven years. On his return to England in 1886 he was dispatched to India, where, however, he only remained a few months, the trying climate not agreeing with either his family or himself. In the year 1887 he became manager of the great Clark Thread Works of Newark, New Jersey, which position he held with conspicuous ability for some ten years. Owing to the great strike there, about 1890-1891, which lasted some five months, and, as may be remembered, ended in serious rioting, he became a marked and prominent figure in mill circles, on both sides of the Atlantic. This famous struggle was one of the most bitter and intense on record, and the manner in which it was conducted and brought to so successful an issue, stamped Mr. Walmsley—upon whom the burden of the fight rested—as a leader of no ordinary capacity. He was for a long time one of the most villified and abused men living, and for an equally long time his life was in constant and daily peril. Time and calmer judgment, however, changed all this, for long before he severed his connection with the company, there was a complete revulsion of feeling, as is evidenced by the handsome and feeling testimonials of regard and esteem presented to him by all alike upon the occasion of his resignation, which became necessary when he accepted the position of agent of the famed and extensive Wamsutta Mills of New Bedford, Mass., which important post he now holds, and has held with distinction since the death of the late lamented Mr. Kent, some two years ago. It is generally conceded that there is no position in the cotton industry of this country more difficult to fill than this particular one, on account of its magnitude and the great complexity and variety of its products.

Mr. Walmsley's success is very generally attributed to the great executive ability and administrative powers with which he is naturally endowed, and no less to the thoroughness and particularity with which he does everything pertaining to his business down to the most minute detail. He is a well-known writer on various questions pertaining to the mill and the cotton industry generally, and has on several occasions contributed articles to the press, as well as papers which he has read before the New England Cotton Manufacturers' Association, notably "The Manufacture of Fine Yarns," and his latest, "Industrial Institutions, Their Organization and Regulation." His able work on "Cotton Spinning and Weaving" has

passed through three editions. When in Russia, he also published in that language a work upon the same subject.

Mr. Walmsley is, of course, in his capacity as agent of the Wamsutta Mills, closely identified with the New Bedford Textile School, the presidency of which was tendered him last year, but which he felt reluctantly compelled to decline, owing to his more immediate duties and responsibilities, which it will be readily understood take up the greater part of his time.

One of the leading traits in Mr. Walmsley's character is his sound judgment and conservatism, and if any one thing more than another has gained for him his enviable reputation, and the respect and esteem in which he is held by all parties,—operatives as well as others—it is his strict regard for fair dealing and justice.

Mr. Walmsley may indeed be proud of his well earned success, and his record and achievements should be a grand incentive to others. It is pleasing to draw to a close this short biographical sketch of Mr. Walmsley with a reference to the strong personal regard and attachment which we understand was felt for him by the late Sir Benjamin Dobson of Bolton, England, whose widely lamented death we recorded and deplored in these pages at the time of its occurrence.

No Appeal Taken From Indigo Decision.

The treasury department has decided not to appeal from the decision of the Board of General Appraisers declaring synthetic indigo, manufactured from coal tar products, to be free of duty as indigo. This decision is published at length in another part of this issue, and the case is one which has attracted great attention in manufacturing and dyestuff circles. The thirty day time limit allowed for appeal from the decision of the Board expired on the 26th of April. The department reviewed the case in a letter to Counsel Washburn, giving its reasons why it declines to appeal and subsequently ordered that synthetic indigo be admitted free of duty the same as indigo made from plants.

--If the proposed erection of a 150,000 to 255,000 spindle cotton mill, at Adams, Mass., is any criterion of the views of cotton manufacturers in this State, of their ability to sustain a profitable competition with Southern mills, the manufacture of cotton hereabout is not likely to be on the decline, or become a past issue, for many years to come. The cotton manufacturing plant, to which this will be an addition, will thus become the largest of anything of its kind in the world. The goods to be made will be of the finest grade of satines, lawns, etc. We learn that other cotton factories are also to be enlarged, and should the present schemes be carried out, the statistics of cotton manufacturing in New England, for 1899, will be in marked contrast with those for 1898.

Exports to the United States from Germany.

According to the latest official statistics, the value in United States currency, of declared exports from the consular district of Chemnitz, Leipzig and Plauen, to the United States, during the quarter ending March 31, 1899, aggregated $3,000,000, about two-thirds, equally divided, coming from Chemnitz and Leipzig. The principal exports to the United States from Chemnitz, consisted of cotton hosiery. In fact, over two-thirds of the exports consisted of this merchandise. The exports from Leipzig consisted chiefly of furs, skins and bristles, chemicals and essential oils. Furs and skins constituted more than one-half of the value. The exports from Plauen consisted almost wholly of cotton goods, as laces, embroideries and hosiery. Two-thirds of the value consisted of cotton laces.

INDUSTRIAL COMBINATIONS.

Industrial combinations are multiplying with marvelous rapidity, and there seems to be no let-up in this respect. This year will be a memorable one in the annals of business, showing an extensive consolidation of enterprises, under heavy capitalization, a large portion of which being fictitious. The textile industry is not alone affected, but amalgamations are being consummated among condensed milk concerns, boiler makers, those engaging in the manufacture of fertilizers, etc., etc.

It is impossible to prognosticate at this time what the real outcome will be, but the situation cannot be looked upon complacently by the public, nor by those charged with legislative duties; and laws will undoubtedly be enacted regulating schemes of this kind, however plausible the excuse may be for their formation, as detrimental in their tendencies to trammel the freedom of trade. These monopolistic corporations cannot be regarded in any other light than inimical to the public welfare. That expenses and cost of production can be largely reduced by business consolidations, admits of no question, but it is of serious moment to the public, or to the consuming classes, whether they are benefited thereby to any appreciable extent, or as much as would otherwise be the case if there were a greater latitude of competition. These matters will soon be brought before the courts of the States and of the nation, aside from getting into legislative halls for counteracting enactments. The tendency of monopolies constitutes a serious menace to the community, and has been so looked upon by courts, as noted in the recent decision of the chief justice of the supreme court of Michigan, who declared that "monopoly in trade or in any kind of business in this country is odious to our form of government. . . . Its tendency is destructive of free institutions, and repugnant to the instincts of a free people, and contrary to the whole scope and spirit of the Federal Constitution, and it is not allowed to exist under express provision in several of our State constitutions."

It is estimated that these combinations, or so-called trusts, in the United States, represent a capital of over $5,000,000,000, of which $900,000,000 appear in preferred stock, and nearly $4,200,000,000, in common stock. This amount is within $1,500,000,000 of the total invested capital in all manufactures, according to the census of 1890, and the latter include duplications. These statistics are worth thinking over, as representing fictitious values, to the extent, at least, of four-fifths of the total capital, or so much "water." Two-fifths of this total amount has come into existence within the last twelve months, mainly within the last three or four months. This is more than an evolution, rather it is a revolution of business methods, and has been conducted on a most stupendous scale, and its suddenness is as remarkable as its magnitude. Its accomplishment has been largely due to the speculative tendencies of recent events, and can hardly be considered as the deliberate acts of a discerning public, who have been induced to make investments in the fickle securities that have been offered. Experience can not be evoked to serve as precedents. The results are problematical, and contrary to the fundamental axioms of trade, as taught by economists. The causes leading to this peculiar condition of affairs will not be fully understood and explained till a number of years have elapsed, to allow a wider circumspection of the contributing events; but it admits of but little doubt that much is owing to the great expansion of machine production, calling for the employment of larger amounts of capital. Though there may be a great saving in operating expenses, it is not a matter of clear demonstration that these savings will go to the benefit of consumers, but, rather, entirely to the proprietors, or to the holders of the shares representing fictitious capital.

There are several questions to be

determined and settled, which as time goes on will become far more prominent than they are today. Whether there will arise new elements of competition, or not, is a matter that cannot be answered until new developments take place. What is to become of the middle men, or commission merchants, that are to be superseded by the new methods of transacting business? And can these trusts really fulfil their many promises of furnishing commodities at a less price to consumers, and at the same time be able to earn dividends upon their inflated stock issues, to satisfy their many share holders?

State laws are bound to come into conflict, as, for instance, between those of New Jersey and the anti-trust laws as recently adopted in Arkansas and contemplated in Texas. There are to be some legal fights in State courts, and cases will soon be presented before the State tribunals of Massachusetts and other commonwealths.

In the textile line, the only combination that is thoroughly organized, and under headway, is the American Woolen Company, of which the Washington Mills are at the head. If this combination had been predicted six months ago, it would have been regarded as totally unfeasible and contrary to every good business principle. The National Woolen Company, made up of prominent concerns about Worcester and the neighborhood of Boston, as well as elsewhere, is not yet a full fledged fact, but the projectors are hopeful, and assert that the scheme will surely be carried through. The United States Worsted Company, taking in some of the largest concerns in this country, has been incorporated, and gives promise of being floated successfully, with a nominal capital of $70,000,000, of which $40,000,000 is common. All of this will not be used at present, the balance to be held in the treasury to meet the necessities as more mills are taken in. According to the scheme of this company, the book accounts and bills receivable are to be purchased for cash, and to be guaranteed. Merchandise and supplies are to be bought for cash, at market value, including all manufactured stock, raw stock, and stock in process of manufacture. The plants consisting of real estate and machinery are to be taken on a basis of one-half cash and one-half common stock. Any sellers may subscribe to as much of the preferred stock as he may choose to take, at par, and receive a bonus of 60 per cent. of the common stock.

PARIS EXPOSITION.

The Hon. Ferdinand W. Peck, United States Commissioner General to the Paris Exposition, is now in Paris, and has secured an additional allotment of space for the United States, to the extent of 56,000 square feet, to be used for transportation and machinery exhibits. Mr. Peck is doing most excellent work, in securing not only a goodly amount of space for the exhibits of this country, but eligible locations as will surely bring American products into conspicuous view of the visitors at the exposition. It can be safely said that no work of this kind has been more satisfactorily done by an United States Commission, at any previous international exposition. Mr. Peck is deserving of a great deal of credit for what he has accomplished.

The prospects are extremely favorable for a creditable display of textile products of the United States at the Paris Exposition. The space allotted for this purpose is very limited, but any desired amount could not reasonably be expected. Applications have already come in, sufficient to take up all of the space at the disposal of the Commission, but it is the wish that a greater diversity of exhibits should be made, and efforts in this direction are now being made, so as to have the exhibit, as a whole, thoroughly typical of the American industry. It will be much superior to anything of the kind that was at the expositions of 1878 and 1889.

There is no reason why the textile manufacturers of the United States should not make a good showing, even if they should rightly reason that they could not secure any foreign trade thereby, aside from any patriotic motives, which should appeal to every public spirited man in this country. An exhibition of a country's manufactures in foreign international expositions contributes as much to the expansion of home trade as most any other means of advertising that can be devised. There will visit the Paris Exposition a large number of American people, who will, as a matter of curiosity, if not of pride, seek out the localities where American goods are shown, and make a more critical examination of the products than would be the case if they were shown them at home, and thus become acquainted, it may be, with goods that are manufactured in their immediate vicinity, that, perhaps, they never heard of before. This has undoubtedly been the experience of everyone who has traveled to any great extent, that of being more interested in their home manufactures when seen abroad, than at any other time.

It took an exhibition of the manufactures of Fall River, not long ago, to acquaint the local manufacturers of that city with the variety and excellence of fabrics made within their own precinct. If American manufacturers want American people to become acquainted with their products, one of the best things that they can do is to make a good showing of them at some foreign exposition.

SKIRTED WOOL.

A recent copy of the Standard, published at Buenos Ayres, has been sent us, containing a letter by Daniel S. Pratt, of Boston, on skirted wools grown in the Argentine Republic. If we had received the paper earlier, we should have been glad to have given space to the letter in full, but can refer to it only briefly in these columns, to the effect that Mr. Pratt believes that an opportune moment has arrived for correcting possible errors in the interpretation of the tariff laws of the United States, to the extent that there shall be no question in regard to the wools of the Argentine Republic, as properly coming within the meaning of the law, as skirted, and subject to the same favor as extended to the wools of Australia. The opportunity presented, as Mr. Pratt views it, is the arrangement that will be made for a commercial treaty between the Argentine Republic and the United States, giving certain reciprocal benefits to each country, based upon a reduction in the American rates of duty, which the law permits President McKinley to adjust, if thought to be mutually advantageous.

Another important matter to which Mr. Pratt calls the attention of the government of the Argentine Republic, for increasing the wool trade with the United States, is the annulment of the four per cent. export duty on wool shipped to this country. The removal of this duty would contribute in reducing the price nearer to a point of profitable exportation.

IS COTTON ROVING A THREAD?

The courts of the United States seem to consider that cotton roving is the same as cotton thread, so far, at least, as the customs tariff is concerned. This question, however, has not been determined by the highest court to which it can be carried. The United States Circuit Court, nevertheless, entertains this opinion, reversing the decision of the Board of General Appraisers, which was that cotton roving is not cotton yarn, but a manufacture of cotton "not especially provided for." We believe that the Board of General Appraisers is correct in arriving at this conclusion. This is a question that our practical mill men might take up for a little discussion, if they see fit. Whether cotton roving is a thread, or not, is a matter that was before the General Appraisers as long ago as the early part of 1897, when the conclusion was arrived at, that, though roving is not a thread,

the difference between the two consists chiefly in the amount of twist that is in them, the former having but a slight amount, and the latter a comparatively large amount, sufficient for the purpose of fabrication.

FOREIGN WOOL CONSUMPTION.

According to the recent statistics of imports of wool, it appears that a very small amount of first and second class wools were entered for consumption for the eight months ending February 28, 1899. This will be seen by the following:

	1st and 2d Class.	3d Class.
In warehouse June 30, 1898,	25,892,288	34,547,076
Imports, less exports, 8 mos. to Feb. 28, 1899.....	2,543 560	40,369,018
	28,435,848	74,916,094
In warehouse Feb. 28, 1899,	21,611,888	36,075,959
Entered for consumption,	6,823,960	38,840,135

These figures show that the domestic article practically received no competition from recent importations, and, therefore, these latter could have exerted no depressing influence upon the former; and, if anything of this kind really took place, it was due to wools in stock that had been previously imported during the free trade period. The importation of third class wool, of course, is necessary for our carpet manufacturers, and can scarcely be entertained as interfering with the domestic product.

CONDITIONS AFFECTING THE TEXTILE INDUSTRIES

It goes without saying, that anything affecting the conditions of trade in general, has a more or less potent influence upon the textile industries in particular. Whenever the conditions of the country are such as to show prosperity among the producing and consuming classes, no one branch of manufacturing can be expected to lie idle for a long-continued period, while others are prosperous. The current year has entered upon a career that has every evidence of being fruitful of happy results, and a profitable one for manufacturing and commercial enterprises. The number of failures has been unusually small since the beginning of the year, and the prospects regarding agricultural crops begin now to be fairly well defined. The earnings of railways are all that can be expected, being larger than at this time last year, and also larger than at this period in 1892, when the country was in an exceedingly prosperous condition. The eastbound tonnage over the railways is remarkably good, and the increase in the westbound tonnage is especially satisfactory in the movement of merchandise from our factories. This state of affairs makes loans on the security of good commercial paper and railway stocks easily obtained at low rates of interest.

It is impossible to make a reliable estimate of the probable crop of cotton for the season of 1899-1900. The planting has already been done, but the acreage will not be known until later in the month. The indications are that a less area will be devoted to cotton than last year, and a reduction will be made in the use of fertilizers, though there has not been any concerted movement on the part of planters and those interested in their cotton crops, to reduce their acreage. Each individual planter has, this year, to act according to his own peculiar circumstances, which makes it rather difficult, at this time, to reach a satisfactory conclusion as to what he has done, or will do. Close observers are inclined to think that there will be about ten per cent. reduction in the amount of acreage devoted to cotton east of the Mississippi. Opinions for a short crop prevail among a number, based on the usual course of events, that two seasons with very large crops, in succession, are usually followed by a season with a small crop. This conforms closely to the general history of cotton cultivation and yield. It is evident that spinners are not troubling themselves in anticipation of a short supply of the raw material, as shown in their smaller takings this

season than last, since the first of September.

Some of the finer grades of cotton fabrics have been advanced in price within the last month, and, though the demand has been moderate, the stocks are light and the production normal. Where prices remain the same, they are held firmly, with no disposition to make concessions, and all of the best makes are reported to be well sold ahead. The home demand is liberal, and there is less inducement to seek an export disposition of goods; still, the latter is in a healthy condition, and shows signs of expansion. The quantity of domestic cotton goods exported in March is about 85 per cent. greater than for the same month last year. For the nine months ending March, 1899, there were exported nearly 300,000,000 yards of goods, against a little over 190,000,000 yards for the same time in 1898, and about 220,000,000 yards in 1897. This shows a satisfactory export trade in this line of manufactures, the Chinese market figuring largely in the taking of such goods.

It is difficult to exactly measure the print cloth market, between the contending forces of a large stock of goods on hand and the tenacity of the committee of mill men to hold prices up. The stock of print cloths has increased steadily for the last eight weeks, due to the fact that the trade is not disposed to bid at the prices fixed by the mills' committee. This committee has just refused an offer for 1,500,000 pieces of regular cloths, at a little below the prevailing quotation of 2¾ cents. At present writing, the estimate of the amount of stock in the hands of manufacturers is put at one million pieces. Whatever the outcome will be as to the price of print cloths, it has been conclusively demonstrated that the control of these goods by a committee, or trustees, was a wise scheme for regulating the print market.

There has been a slight improvement in the demand for heavy weight woolens and worsteds, such as Clays and piece-dyed cheviots, and other staple fabrics. There has been no change in the tone of the market within the last month. Manufacturers feel confident in the strength of the market, as shown in their indisposition to lower prices or offer any concessions. There has been no pressure to sell, so far as we can learn, while the re-order business in light weights has been well sustained. Imports of manufactures of wool are relatively small, having amounted, for the nine months ending last March, to but little over $11,000,000, against $27,000,000 for the same period in 1897.

Among the singular incidents that the wool market occasionally presents, are the presence of parties from abroad trying to dispose English medium wool on the basis of 32 cents clean, and the recent shipments abroad of fine American Territory wool. Some Australian wool has been re-exported, altogether showing an unsettled state of the market affecting prices here and abroad. Taking our tariff into consideration, the American market for wool is the cheapest in the world. The annual review of the wool trade of Australia, as presented by Goldsbrough, Mort & Company, Melbourne, confirms and emphasizes what has been generally known right along, of the existence last year of a severe drought through the Australasian colonies, affecting detrimentally the wool clip of last season. "The pastoralists of Australia have had, in spite of every effort, to face a terrible death rate, added to which, the wool actually marketed has in many instances lost its true character and style, which will probably take years of careful breeding to regain." The only recompense that they have had is the better prices that have been obtained for their clips. These adverse conditions are particularly onerous when taken in connection with the droughts that have existed for the last four years. With the driving back of the pastoral occupa-

tion into the arid regions of interior Australia, these droughts are likely to be felt with greater or less severity until some method is devised by which ranches can be supplied with water by means of artesian wells. Taking the prospects as they appear today, there is more to indicate an advance in the prices of wool, than a decrease. The relatively high price of merino wool may, in time, turn the attention of growers to the breeding of this class of wool, instead of crossbreds, which are now in fair abundance. The future of coarse crossbreds and Lincolns is looked upon as being surrounded with difficulties too great to forecast at the present time. This question is largely affected by the present and future status of the frozen meat trade.

MOISTURE IN TEXTILES

It is a well known fact that all textiles when exposed to dampness absorb moisture in large quantities, and consequently, increase in weight. When stored in a dry place the same textiles lose their moisture. The effect of this hygroscopic property is that the weight of a given lot of textiles varies from day to day, so that it is absolutely impossible to tell at any time the actual weight of that lot without testing it. It is easy to understand that these conditions have been and still are a source of great trouble to dealers.

Let us suppose, for instance, that a lot of wool has been baled and weighed on a damp or rainy day, then kept in storage for some weeks and shipped in dry, windy weather. When the lot arrives it will have lost nearly all its moisture, and when it is weighed by the buyer every bale will appear to be short, complaint will naturally be made and trouble is likely to ensue. Under reversed conditions the lot will have gained.

As may naturally be supposed such a state of affairs cannot be suffered to continue indefinitely. Wool is the fibre most sensitive to moisture, varying as it may from 5 to 35 per cent. of its actual weight, according to the action of atmospheric influence. But as the price per pound for wool was less than for silk, it was in the silk trade that the matter was first studied, and in 1750 an establishment was founded in Turin, to ascertain the "condition" of the silks sold on that market. From this we have the term "conditioning."

Actually, a "conditioning house" is a laboratory in which tests are made to ascertain not only the percentage of moisture contained in a textile, but also the percentage of foreign matter (gum, grease, soap, oil, etc.), the size or count, the tenacity or strength, the elasticity, the amount of twist, etc. In fact, a conditioning house may be called an assay office for textiles.

In some silk centres the practice of conditioning was extended to high grade wools used in mixed goods, then to ordinary grades, and at the present time all European textile markets possess at least, one conditioning house.

In order to have a basis for commercial purposes it is necessary to make a certain allowance for moisture, because we never find, in normal conditions, silk or wool absolutely dry. That allowance, or "reprise," is the quantity of moisture which is added to the absolute dry weight in order to obtain the conditioned weight; it cannot be the same for all textiles for they do not contain the same amount of moisture when placed under identical influences. An International Congress met in Turin in 1875 and adopted the following reprises:

Silk, 11 per cent.; Wool (combed) 18¼ per cent.; Wool (spun), 17 per cent.; Cotton, 8½ per cent.; Flax, 12 per cent.; Hemp, 12 per cent.; Tow (spun), 12½ per cent.; Jute and Phormium, 13¾ per cent. of the absolute dry weight of the textile.

Those percentages are now applied in all conditioning houses of Europe, Asia and America.

NEW ENGLAND COTTON MANUFACTURER'S ASSOCIATION.

Annual Meeting at Boston, Mass., April, 26-27, 1899.

The annual meeting for 1899-1900 of the New England Cotton Manufacturers' Association, was held at Chipman Hall, Boston, Mass. There were four sessions held, two on each day. There were present about 200 members, including presidents, treasurers, managers and superintendents of cotton mills in New England and elsewhere. Stephen A. Knight president of the association, occupied the chair. It was expected that Josiah Quincy, Mayor of Boston, would address the association, but at the last moment, he sent a letter to the secretary, regretting his inability to be present. President Knight delivered his annual address, devoting a good portion of it to a retrospective view of the progress of manufacturing during the century. He said in his address that the membership of the association, not including the applicants who were voted upon at the meeting, was 544, against 523 at the beginning of the year, showing a gain of 21 members. The outlook for the coming and subsequent years was referred to as most encouraging. He said that the finances of the association are in a healthy condition, and the dark clouds of adversity that hung so low and heavy over the cotton industry of New England, one year ago, have, in a measure, lifted, giving encouragement for the future. "We are a nation of producers, and when the conditions of labor in the North and South are more nearly equalized (as they ultimately will be), and when the employer and employee better understand the relations they hold one to the other (as sooner or later they must), with a tariff protection that will simply protect against the cheaply paid foreign labor, then and not till then will the onward march of our country be one of continued and unfailing prosperity." Mr. Knight referred to the very important step that had been taken by the Board of Government, adopting the medal system, which is described and illustrated in a separate article, to be found elsewhere in this issue.

The first paper read was by Herbert E. Walmsley, New Bedford, Mass., on

ORGANIZATION AND REGULATION.

The ideal manufacturer in his role of employer must be a natural leader of men. True indeed it is, "that the greatest study of mankind is man." No man can find himself in a position so trying and exacting as that in which he is called upon to control and direct his fellows; no position which more greatly calls for the exercise of tact, consideration and sound judgment. He must have a power of first choosing his assistants rightly, and then trusting them fully; of interesting them in the business and of getting them to trust him, so as to bring out whatever enterprise and power of organization there is in them; while he himself exercises a general control over everything and preserves order in the main plan of the business.

The abilities required to make an ideal employer are so great and so numerous that very few persons can exhibit them all in a very high degree. Their relative importance, however, varies with the nature of the industry and the size of the business; and while one manufacturer excels in

one set of qualities, another excels in another; scarcely any two owe their success to exactly the same combination of advantages; but in all will be found some measure of the broad faculties of judgment, promptness, resource, or steadfastness of purpose.

Whilst the head of a large business can reserve most of his strength for the broadest and most fundamental problems of his trade, he must assure himself that his managers, clerks and foremen are the right men for the work and are doing their respective work well and thoroughly; beyond this, without burdening his mind with too much detail, he must nevertheless control every detail from certain given and leading points. System and regulation will enable him to do this and to keep his mind clear and fresh for thinking out the most difficult and vital problems of his business; for studying the broader movements of the markets, the yet undeveloped results of current events and for contriving how to improve the organization of the internal and external relations of his business.

In the direction and regulation of the affairs of a manufacturing or industrial corporation there is not, in my judgment, any one thing or any combination of things of more importance than thorough organization and perfect discipline; these are indeed indispensable to the success of any enterprise.

The executive officers of any institution, more especially one in which a large number of people are employed, must administer its affairs in such a manner as to impress upon every one employed the absolute necessity of harmonious co-operation and discipline. A perfect organization contributes to the pride of all, and beyond the point reached there can not be further perfection without further organization. This naturally and necessarily demands concentrated and untiring effort, with set and deliberate determination to bring out the best powers of all. The best and most nearly perfect conditions attainable are when each and every one conscientiously contributes his individual part so as to produce the most telling and effective whole; no one part should be wanting or favored at the expense of any other; there must be no weak link in the chain. A standard must be established to which every one and everything must be deliberately brought and rigorously held; an example must be set to which all must conform.

Perhaps the most striking feature of modern industrialism is that whenever individuals join their actions for a common end, some division of labor spontaneously arises. This division of labor has been carried to an extraordinary degree of completeness; 100 people working in combination produce far more than a hundred times what the most competent workman could produce by himself. This division of labor, by the concentration it induces, increases the skill of the worker and the likelihood of invention and improvement in mechanical appliances.

Great discretion and good judgment must be exercised in handling and controlling the operatives, and above all, justice in every sense of the word must be meted out to them, unless unwisely influenced. My own experience of them as a body is that they are not unreasonable, and if we expect of them efficient and faithful work, we must at least be prepared to be fair, just and honorable in all and every one of our dealings with them. These few words convey much; more need not be said to thinking men.

The superintendent's place is in the mill and not in the office—supervising generally and giving his undivided attention to the work and to everything that is going on in the mill; also in conscientiously seeing to it that the orders and instructions of the general manager are lived up to and carried out to the very letter.

The overseer's place is in his room, moving around all the time attending to his various duties, and setting an example to the help in his particular-

ity and thoroughness, for upon the united untiring effort and example of both superintendent and overseer depends the degree of attention employed by the operatives.

Every employee must subscribe and give obedience to the rules and regulations of the establishment, and the superintendent or overseer who through his own individual effort and example can put into practical and successful operation a system of governing the operatives whereby faithful and intelligent service is secured, becomes himself an invaluable factor of the situation.

The treatment of subordinates is one of the most important points in the entire system of a correct discipline. If we demand and expect loyalty and a faithful performance of duty on the part of our lieutenants, we must in turn recognize, support and back them up to the fullest possible extent; there must be no misunderstanding as to what is due their position and office; proper respect must be shown to all in authority.

The general manager should keep in close touch with the superintendents, the superintendents with the overseers, and the overseers with the operatives; each realizing his own responsibility and holding to strict accountability the other. In this way alone should each one govern his conduct and his actions in the performance of his daily duty; otherwise there will most surely be friction, dissatisfaction and discontent, with consequent demoralization of the entire system.

The next paper was prepared by Joseph Nasmith, of Manchester, England, who was not present to read it himself, on "Depreciation," to be found on page 60 of this issue.

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Secretary Woodbury read a very entertaining paper on "Cotton Manufacturing at the South in 1850," being the outcome of an interesting communication addressed to the Rt. Rev. William Lawrence, Bishop of the diocese of Massachusetts, from C. M. Baker, of the Graniteville Manufacturing Company, Graniteville, S. C. The basis of Mr. Baker's communication to Bishop Lawrence, was the discovery, among old letters and documents of the Graniteville Company, of a letter written by Amos A. Lawrence, to William Gregg, of Kalmia, S. C., in regard to cotton manufacturing in the South, and its relative status and prospects with that in the North.

The afternoon session of the first day was opened with a paper by Willian P. Wilson, Director of the Commercial Museum, Philadelphia, on "The Cotton Trade with Our Newly Acquired Territory." Mr. Wilson, in his paper, referred to the statistics for the year 1898, showing that we have exported $1,233,000,000 worth of our own products, $307,000,000 of which were manufactured goods. Last year we were for the first time the largest exporting nation in the world, the value of our exports exceeding those from Great Britain by $100,000,000. In cotton piece goods, 25 years ago, the United States exported $1,200,000, while last year we exported $15,000,000. It will thus be seen we have already started on a war of invasion of the markets of the world. Today we are in the front rank of nations seeking entrance into the markets of the Orient.

The next paper was by William G. Nichols, Lowell, Mass., on

METHODS OF COST FINDING IN COTTON MILLS.

The subject of Costs of Manufacturing appeals to every practical manufacturer, since it is one with which he has periodically a vital interest. Some method must be resorted to, in order to determine what are the results for which the business has been carried on. It may be simple and elementary, or complicated and deeply analytical. Three points are essential, that it be accurate, simple as possible, and inexpensive.

A good system has three uses. First: a means of making, periodically, a reliable estimate of the cost

of goods actually manufactured. Second: a basis for making estimates on samples of goods of similar character, proposed to be made. Third: a means of comparison of expenses at different times.

There is no one method best for every mill. Any good system may need fitting to the exact circumstances of a new application.

The Average Number idea has, for many years, been the central feature of the plan in common use. But the increased variety of organizations, made to fill modern needs and uses, has stretched it beyond its original restrictions, has shown its limitations, and proved it to be inadequate.

A certain mill in making up its accounts, takes a careful inventory of the stock in process, and places value upon it according to this rule: one cent per pound for the stock, and add the labor cost, up to the department where the stock is in process. This is neither honest book-keeping, nor fair to the management. In this case, it is an old custom, not easily changed. Consequently, if the stock in process at the end of the six months, exceeds what it was at the beginning by thirty thousand pounds, the cotton account loses a credit due it, of about two thousand dollars (when clean cotton is worth seven cents a pound.) Again other mills close their cotton account by a credit of all the stock in process at its value plus the labor on the same, up to the department in which it is inventoried. A case of crediting to the wrong account.

In another instance the treasurer of a mill, finding the waste account too large, added, on the books, to the stock in process, believing that some error had been made, which upon careful examination, failed to be detected. At the end of the six months, there was still the same deficit, which seemed to prove that the original mistake had been made earlier than was supposed. The addition to the stock in process had now to be borne as a loss, or carried on indefinitely.

Within the last fifteen years the conditions surrounding many of our mills have changed. On the one hand competition has reduced the margin of profit in manufacturing, and rendered imperative the reduction of all but the most necessary expenses, and also in those mills making a variety of goods, a closer inquiry into the relative costs of manufacture. Where a mill has departed from producing a single style of goods, to a variety of similar organizations, it is possible by an examination of the costs of various departments, to estimate with great accuracy the total cost of each kind of goods. In such a mill, where the yarns do not vary widely in number, and the organizations of the goods are not greatly dissimilar, the following method may be used with convenience, of separating expenses as are common to the entire output of the mill, and dividing them in the proportions of the average numbers of the yarn employed in the construction of the different kinds of goods. These expenses of carding, spinning, repairs, etc., are called "costs in common." Such expenses as are not common to all classes of goods, but are incurred only on certain classes, are termed "special costs," and are divided only among goods where the cost is incurred.

Various rules for finding the "average number of yarn" are in use, but the following has the merit of being based on reason, and, therefore, of correctness.

Divide the sum of sley and picks, by sum of sley divided by the number of warp yarn, and the picks per inch divided by number of filling yarn.

The rationale of the rule is as follows:

The sley divided by the number of the warp yarn gives the number of ends of number one yarn, that would be equal in weight to the warp used.

The picks per inch divided by the number of the filling yarn, equal the number of threads of number one yarn, which would equal the picks per inch of filling used.

The picks and sley are thus reduced to a common basis, that they may be added together. Added, they represent the number of threads of number one yarn equal in weight to the threads of warp and filling.

This weight of yarn is now to be divided into as many threads as there were before, but they are to be of equal size. Mathematically this is done by dividing these threads of number one yarn by the sum of picks and sley. The result is "the average number of the yarn."

The average number of yarn in cloth "G," in the succeeding example is as follows:

25 warp, 18 filling, 86 sley, 46 picks per inch.

$$86 \div 25 = 3.44$$
$$46 \div 18 = 2.56$$
$$6.00$$

86 (sley) + 46 (picks) equals 132.
132 ÷ 6 equals 22, the average number of the yarn.

Suppose the mills were manufacturing the following kinds:

Goods.	Warp.	Sley.	Filling.	Picks.	Width. Inches.
G flannel	25	86	18	46	25
C "	22	76	12	48	25
XX "	19	70	4	48	32
R sheeting	19	64	24	68	36
S "	22	56	22	56	37½
F "	19	64	24	68	42

And the six months production to have been,

		Yds. per lb.
800,000 lbs.	of "G" flannel, brown.....	5
1,000,000 "	"C" flannel, brown.....	4
400,000 "	"XX" flannel, bleached...	1½
2,000,000 "	"R" sheeting, brown.....	3½
300,000 "	"S" sheeting, brown.....	4
200,000 "	"F" sheeting, brown.....	3
4,700,000		

First find the average number of yarn in each cloth. By the rule given above they are

Cloth.	Average Number.	Cloth.	Average Number.
G flannel	22.	R sheeting	21.29
C "	16.64	S "	21.96
XX "	7.53	F "	21.29

From the total production of the six months, and the average number of each kind of cloth we obtain the average number of the mill, thus:

		Hanks.
G flannel.....	800,000 lbs. × 22.	= 17,600,000
C "	1,000,000 lbs. × 16.64	= 16,640,000
XX "	400,000 lbs. × 7.53	= 3,012,000
R sheeting.....	2,000,000 lbs. × 21.29	= 42,580,000
S "	300,000 lbs. × 21.96	= 6,588,000
F "	200,000 lbs. × 21.29	= 4,258,000
	4,700,000	90,678,000

90,678,000 ÷ 4,700,000 = 19.29, average number of the mill.

Next find the labor cost per pound from the pay roll.

Picking	$11,578.00
Carding.....	24,780.00
Warp spinning and spooling.	30,380.00
Mule spinning	12,320.00
Warping, dressing, drawing in	11,830.00
	$90,888.00

$90,888.00 ÷ 4,700,000 = 1.933 cents per pound, labor cost.

Throughout this series, the decimal point, in figures representing costs per pound, is always placed between cents and mills.

From the pay roll, we also find the number of cuts woven of each grade of cloth. This, multiplied by the price per cut, gives the piece work. Deducting the sum of these products from the total amount spent for weave room labor, leaves the balance expended for day work. Add to the cost of piece work on each grade, the same percentage as the total day work, is to the total piece work.

Divide this total cost of weaving each grade, by the pounds of same produced, as follows:

Cloth	Pounds Produced.	Total Wages.	Weaving Cost per lb
G.....	800,000	$19,315.00	2.419 cts.
C	1,000,000	19,890.00	1.989 "
XX	400,000	4,685.00	1.171 "
R	2,000,000	47,736.00	2.387 "
S	300,000	7,137.00	2.379 "
F	200,000	4,095.00	2.048 "
		$102,843.00	

Next find the "special expense" of sheetings:

Burlaps	$3,000.00
Rope	1,700.00
Twine.....	530.00
Paper	700.00
Stamps	50.00
Sundries	150.00
Total.....	$6,130.00

Total pounds of sheetings:

R	2,000,000
S	300,000
F	200,000
	2,500,000

$6,130.00 ÷ 2,500,000 = .2452 cents, the cost per pound of "special expense of sheeting."

"Special expense" of flannels:

Napping.....	$3,000.00
Flannel cases	1,144.00
Stamps	140.00
Paper	26.00
Sundries	300.00
Total	$4,610.00

Total pounds of flannels:

G	800,000
C	1,000,000
XX	400,000
	2,200,000

$4,610.00 ÷ 2,200,000 = .2095 cents, cost per pound of "special expense" on flannels.

"Special expense" on bleached flannels:

Net cost of bleaching	$6,000.00
Freight	1,000.00
Extra handling	200.00
Sundries	800.00
Total	$8,000.00

$8,000.00 ÷ 400,000, the pounds bleached, equals 2 cents per pound, "special cost of bleaching."

The cost of cotton:

Stock in process Jan. 1. Value	$110,000.00
Raw cotton used six months	500,000.00
	$610,000.00
Stock in process, June 30	73,600.00
	$536,400.00
Less value of waste sold	12,400.00
Value of cotton used	$524,000.00

$524,000.00 ÷ 4,700,000 pounds of goods produced equals 11.149 cents per pound, cost of cotton.

General expense:

Cloth room	$14,077.00
Repair shop	9,050.00
Belt and roll shop	5,853 00
Yard and watch	7,875.00
Engineers	4,501.00
Materials for repairs	11,879.00
Supplies and sundries, gas	17,115.00
Fuel	14,805 00
Starch	8,288.00
Salaries and office expense	7,154.00
Insurance and taxes one half year	25,900.00
New machinery	23,500.00
Treasurers' office, interest, etc	28,000.00
	$177,997.00

$177,997.00 ÷ 4,700,000 = 3.787 cents per pound general expense.

Cost in common, labor and general expense:

Labor, manufacturing, per pound	1.933 cts.
General expense	3.787 "
Total	5 720 "

This average cost per pound is now divided by the "average number of the mill," to obtain the "cost per number," or "cost per unit," or "cost per hank" or "skein" as it is variously called. 5.720 cents divided by 19.29, the "average number of the mill," equals 0.2966 cents per number, cost of manufacturing labor, and general expense.

Cost of labor and general expense, each kind of goods:

Kind.	Average Number.		Cost per lb. pr. no.		Cost per lb. Goods.
G	22.	×	.2966	=	6.525
C	16.64	×	.2966	=	4.935
XX	7.53	×	.2966	=	2.333
R	21.29	×	.2966	=	6.315
S	21.96	×	.2966	=	6.513
F	21.29	×	.2966	=	6.315

Special costs per pound, each kind of goods:

First find the average number of the sheetings:

	Pounds Produced.		Average Number.		Hanks.
R	2,000,000	×	21 29	=	42,580,000
S	300,000	×	20.96	=	6,288,000
F	200,000	×	21.29	=	4,258,000
	2,500,000				53,126,000

53,126,000 hanks ÷ 2,500,000 = 21.25, the average number of the sheetings. 0.2452 special cost per pound of sheetings ÷ 21.25 = 0.0116 cents per number.

Costs per pound of goods:

	Average Number.		Cost per lb. pr no.		Cost per lb. Goods.
R	21.29	×	.0116	=	.247
S	20.96	×	.0116	=	.243
F	21.29	×	.0116	=	.247

Flannels:

First find the average number of the flannels:

	Pounds Produced.		Average Number.		Hanks.
G	800,000	×	22.	=	17,600,000
C	1,000,000	×	16 64	=	16,640,000
XX	400,000	×	7.53	=	3,012,000
	2,200,000				37,252,000

37,252,000 hanks ÷ 2,200,000 = 16.93 "average number of flannels." 0.2095 cents per pound, special cost of flannels ÷ 16.93 = 0.0124 cents, cost per number of flannels.

Costs per pound of goods:

	Average Number.		Cost per lb. pr. no.		Cost per lb. Goods.
G	22.	×	.0124	=	.273
C	16.64	×	.0124	=	.206
XX	7.53	×	.0124	=	.093

Summary of costs per pound:

	G	C	XX	R	S	F
Cotton	11.149	11.149	11.149	11.149	11.149	11.149
Costs in common	6.525	4.935	2.333	6.315	6.513	6.315
Weaving	2.419	1.989	1.171	2.387	2 379	2.048
Special sheeting	–	–	–	.247	.243	.247
Special flannel	.273	.206	.093	–	–	–
Special bleaching	–	–	2.000	–	–	–
	20.366	18.279	16.746	20.098	20.284	19.759

Costs per yard:

	Cost per lb.		Yards per lb.		Cost per yd.
G	20.366	÷	5.	=	4.07 cts.
C	18.279	÷	4.	=	4.56 "
XX	16.746	÷	1.50	=	11.16 "
R	20.098	÷	3.50	=	5.74 "
S	20.284	÷	4.	=	5.07 "
F	19.759	÷	3.	=	6.59 "

Proof:

Carding, etc.	$ 90,888.00
Weaving	102,858.00
Cotton	524,000.00
General expense	177,997.00
Special expense, sheeting	6,130.00
Special expense, flannels	4,610.00
Special expense, bleaching	8,000.00
Total cost for mill account books,	$914,483.00

600,000 lbs. G	at 20.366 =	$162,928.00
1,000,000 lbs. C	at 18.279 =	182,790.00
400,000 lbs. XX	at 16.746 =	66,984.00
2,000,000 lbs. R	at 20.098 =	401,960.00
300,000 lbs. S	at 20.284 =	60,852.00
200,000 lbs. F	at 19.759 =	39,518.00
Estimated cost		$915,032.00

$915,032.00 minus $914,483 equals $549.00 discrepancy in proving. This is about one-twentieth of one per cent., and if the decimals were carried farther, this would be done away with.

In calculating by the foregoing method, it is not unusual to estimate the cost of weaving by the average number in the same manner as the carding, etc. An expense so great as weaving, greater than carding, spinning, warping and dressing, combined, is worthy of being determined with precision. More especially, as this may usually be done with very little labor. If there is a different price per cut for weaving each mark of goods, it is only needful to count the pieces at each price, and multiply by the price. Add the day labor either in a per cent. of the piece work, as previously described, or in proportion to the looms run on various kinds of cloth.

A modification of this system, by which the cost is carried to completion, reckoning by the cost per hank, for cotton, labor, repairs, etc., is sometimes followed. The hanks per yard of warp and filling are separated in calculating the cost of carding, spinning and dressing, and the total hanks per yard used in subsequent operations and for general expenses. Though simpler in detail, this method is not so directly available for making estimates of samples of goods proposed to be made, as to calculate cost by the pound.

This system affords a popular and convenient method of making up costs in mills where there is a limited range in the numbers spun and in the organizations.

Where there is a wide variety of yarns made, and where the other disturbing elements, frequently encountered, occur, such as, a portion of the product sold as yarn, or yarn purchased, a variety of stock used for different grades, and special processes, as combing, extra or slack twist, the methods previously described are insufficient.

They may be used in part and supplemented by guess work. But even an "educated guess" is likely to be so far afield, that when by a reasonable amount of clerical work, a cost figure can be obtained upon which one may rely with confidence, the greater satisfaction and certainty require its expenditure.

A "proof" such as shown in the preceding illustration is sometimes triumphantly exhibited as demonstration of correct cost estimation, when it is, in truth, only a proof of the mathematical calculations, having been correctly performed. It would be as reasonable to suppose that because four men weighed alike, they were therefore all the same height.

It should be remembered, also, that in the foregoing methods, if one figure is too high, another must be too low, which is likely to lead to a loss of business on the over-rated goods, and an increase on the undervalued.

An estimate too low may be a serious matter, compared with which, the labor necessary to obtain reliable figures would be trifling.

That the "average number" hypothesis is not exact, and further that for wide ranges of numbers it is thoroughly unreliable, is demonstrated not from principle alone, but also from actual observation and examination of fact.

Let us first examine the card room. By the "average number" system the estimated cost of making roving varies in a sliding scale in proportion to the number of yarn spun, which is not the case as a fact. The roving is not made in a separate size for every

number of yarn, but a few sizes answer for a certain range of yarns. For instance, 3.50 hank roving may serve for spinning single, any yarn which may be required from 21 to 35. The cost of carding would be the same for either number. Or 6 hank roving might serve double or single, for any number from 24 to 48, and the cost of carding would be the same. Neither does the cost of carding vary in the same ratio as the number of the hank roving.

It happened to the writer, some years ago, to make a detailed examination of the cost of carding in a certain mill, with the following results:

Cost of carding:

2.70	hank	roving,	1.05	cents	per lb.
4.10	"	"	1.11	"	"
5.40	"	"	1.42	"	"
6.00	"	"	1.45	"	"
8.30	"	"	1.75	"	"
12.00	"	"	2.04	"	"

It will be noticed that 2.70 is about one-third of 8.30, but the cost of making 2.70 is about two-thirds that of making 8.30, instead of one-third. 12.00 hank costs less than twice as much as 4 hank, rather than three times as much.

In another mill the cost of making rovings ran as follows:

Cost of carding:

.59	hank	roving,	.50	cents	per lb.
.75	"	"	.54	"	"
1.25	"	"	.67	"	"
2.00	"	"	.74	"	"
2.50	"	"	.76	"	"
4.00	"	"	.99	"	"
6.00	"	"	1.22	"	"

In the spinning room, the departure from the ratio is not so great, but is evident from the following costs of spinning:

Cost of mule spinning:

No.	6.25	yarn,	.43	cents	per lb.
"	8.00	"	.47	"	"
"	9.00	"	.53	"	"
"	11.00	"	.56	"	"
"	12.00	"	.62	"	"
"	14.00	"	.66	"	"
"	18.00	"	.96	"	"
"	20.00	"	1.01	"	"
"	24.00	"	1.08	"	"
"	28.00	"	1.15	"	"

In practice there comes a time when the cost of spinning, instead of growing less per pound, as the yarn becomes coarser, increases on account of the loss in production, due to the large amount of time consumed in doffing.

These considerations force us to the conclusion that under extreme conditions, or unusual circumstances, the system of average number fails of being applicable.

David M. Bates, Jr., Wilmington, Del., next read a paper that was listened to with much attention, on

GRAY GOODS FROM THE BLEACHER'S AND FINISHER'S POINT OF VIEW.

No part of the construction of a piece of gray cloth demands more attention than the selvedge. Upon it the finisher must depend to get his goods through the processes of singeing and of bleaching. The requisites of a good selvedge are strength combined with elasticity, and a weave which will render the edges of the piece presentable and attractive when it comes up to the folding room. Mere strength, at first thought, would seem all that is required, but this when unaccompanied by pliability is useless. For good results it is necessary to have the selvedges strong and even enough to avoid all likelihood in running through the bleach-house of a break or fray, which, be it ever so slight, will cause a tear clear across the piece. At the same time they must be sufficiently elastic to allow the body of the cloth to take its full share of the strain, as otherwise the chances of the selvedges failing under the severe pull put upon them are largely increased. It is this latter reason which explains why selvedges may be made too strong.

Tape selvedges, so common for example on three and five-leaf twills and fine plain goods used for umbrella purposes, on satines and on fine cambrics, are pre-eminently strong selvedges looked at from the "gray goods" point of view. Few selvedges, however, give more trouble in work than these, as at present made.

When the cloth reaches the bleach-house the weakened selvedges show up. Breaks in the goods as they are drawn through the pot-eyes down into the rinsing, chemic and souring ma-

chines, and ensuing wind-ups round the rolls, are not infrequent. Many yards are wound up before the machine can be stopped, and the cloth which has to be cut off to free the rollers is lost for all practical purposes. Not only is the loss of yardage from this cause a source of annoyance, but the short piece lengths thus made between stitchings are hard for the trade to dispose of.

To sum up this matter then, the difficulties which selvedges cause are due principally to their being too tight. Tape selvedges seem for the finisher's work too much a thing apart from the body of the cloth to run well with it; they do not work as satisfactorily as the unpretentious ones found on many plain weave goods, a selvedge for example of two-ply untwisted warp and single woven filling.

Of all matters which demand intelligent consideration by both manufacturer and converter, as well as finisher, the question of strength is the one most neglected. When the converter wishes to handle goods for a certain finish he specifies very carefully the count, width and weight which his goods must be made, but of the strength needed for the use to which the finished cloth is to be put he generally tells the manufacturer nothing. The manufacturer accordingly produces goods of the required width, weight and count to fill the order. He naturally puts no more twist in the yarns for these goods than is necessary to make them weave in a satisfactory and economical manner. The width, weight and count of the gray cloth being according to contract, the goods are accepted by the converter, who sends them to the bleachery to be finished. Suppose, as is often the case, that the finish is an old and standard one which has given satisfaction to the converter for a number of years, but that, on the other hand, the mill from which this lot comes is one which has never sent goods for this finish before. It is quite possible that these goods will come up tender and unfit for the use intended, especially if the finish is one requiring a moire effect, or something of that nature, where the finishing work is severe and puts a heavy strain on the cloth. If such is the case, the owner of the lot expresses great surprise that the finisher, after years of experience, should tender his goods on a standard finish. To the claim that the cloth is from a new mill and not the same as that formerly sent, the invariable reply is that the width weight and count are no different from previous lots. Well enough—but granting this, is the strength the same? Probably not, for this is just the very point which both converter and manufacturer have overlooked—the strength demanded for the required finish—and yet this is the essence of the whole matter, the strength in cloth of the same grade from different mills often varying considerably. In plain weaves it is of course desirable to have evenly woven cloth of the right weight and count, but it is no less important that goods to be used for purposes such as dress linings must have enough strength, first, to undergo the processes required for the finishes the trade demands, and second, to give satisfactory wear in the uses to which they are put.

The successful sizing of the warps is by no means proved, simply because the cloth leaves the loom sufficiently free from knots to show few warp threads broken in weaving. In the first place the size should be as simple as possible in composition and the warp should contain the smallest amount of it needed. Gray goods are found to lose roughly, something like 14 per cent. in weight by bleaching; of course part of the loss is accounted for by the waxes and resins found in raw cotton, but a considerable amount is made up by the size in the gray goods.

It is a common practice in folding the gray goods at the mill to crumple up the inside end of the piece with

the hand as the cut is doubled over ready for baling. This, and the subsequent compressing in the bale of the mussed-up end, cause creases often extending a yard or more into each piece. As some pieces are only 50 yards in length, this may mean a creasing of from two to four per cent. of the cloth. These creases cannot be gotten out of the goods when they are run into work, no matter how carefully the piece-ends are sewed together. They cause much trouble in singeing, resulting in an uneven surface on the finished cloth, especially on grades like satines which come up to the folding room with fuzzy streaks, making remnants of many yards which with the least bit of care at the mill would come out perfect.

Another small detail which is of importance is to have the markings on the gray piece-ends made with a chalk crayon, free from wax or grease, which will bleach out, instead of with black lead or graphite, which cannot be removed.

Alfred A. Hunting, Salem, Mass., next read a paper on

THE DRYING OF CLOTH.

To dry cloth quickly, first squeeze it as dry as possible. Squeeze rolls should be of large diameter and preferably a two nip machine; the greater the diameter of the rolls the more contact the rolls will have, therefore the cloth is under pressure a longer time, and can be squeezed drier with less pressure than it will take to squeeze to the same degree of dryness when rolls of small diameter are used. Cloth that is starched or filled will be much better prepared when large rolls are used, the starch or filling will be forced to the centre of the cloth giving a more even finish. Large rolls properly made are ridged and will not spring perceptibly, when rolls spring even squeezing cannot be done, the centre of the cloth will be carrying more moisture than the edges, the wettest part of the cloth governs the speed of drying. Every pound of water squeezed from the cloth provides for quicker drying, it also saves steam, which means a saving of money. Cloth will carry much more than its own weight of water and still seem to be pretty well squeezed, but compare such cloth with that which has been properly squeezed, the difference will be marked. Cloth can be squeezed at fast speed so that 100 pounds of cloth will be carrying only 75 pounds of water.

Conditions have much to do with the squeezing of cloth but there is no reason why cloth cannot be squeezed better than is generally being done. The drying of cloth is expensive under the best conditions; the following comparisons will serve to give you an idea of the cost. The memoranda was obtained for the purpose of determining as closely as possible the number of pounds of cloth that one pound of steam would dry, when the drying cans were running under the ordinary conditions. The memoranda was obtained at different factories and under the varying conditions as found, the time ranging from four to five hours to an aggregate of several days; in each case the water discharged from the cans for a given time was weighed, the yards, weight and kind of cloth was recorded, and the average taken. The average of several lots of cloth weighing from 12 to 9 yards per pound condensed in the drying cans 2.50 pounds of steam per pound of cloth dried. This amount of steam was very high but the cloth carried 125 pounds of water per 100 pounds of cloth, and the vapor from the water evaporated from the cloth was not promptly removed from the drying room.

A lot of cloth weighing from nine to six yards per pound condensed two pounds steam per pound of cloth dried.

A lot of cloth weighing from 3.75 to four yards per pound condensed 1.77 pounds of steam per pound of cloth dried.

A lot of the same cloth squeezed

drier condensed 1.60 pounds of steam per pound of cloth dried, in this case the cloth was squeezed drier.

A lot of seven-yard cloth was dried at the rate of 1.30 pounds of cloth per pound of steam.

A mixed lot of cloth containing runs of heavy and light cloth was dried at the rate of 1.30 pounds of cloth per pound of steam. The cloth of the fourth set of figures was better squeezed than was the case of the first two, the last two lots were better squeezed than the previous four lots, and the vapor in the drying room removed to a greater extent than was the case of the first two lots, but not as satisfactory as it should have been to have obtained the best results. The weight of the cloth did not seem to have as much effect in condensing the steam as did the amount of water the cloth was carrying and the fact that the vapor in the drying rooms was not promptly removed.

The closing formal paper of the afternoon session of the first day was read by Arthur Parkinson, New York, on

POINTS ON SIZING, FINISHING, AND PACKING GOODS.

Sizing of cotton yarn is one of the principal factors in manufacturing. Its importance lies in the fact that poor or weak yarn can be improved considerably, and that good or strong yarn can be damaged so much, that it is unfit to weave. Aside from the fact that the sizing or slasher machine must be in fit condition to turn off good work, and that the attendant must be qualified by varied experiences to execute his work intelligently, the important question is, what materials shall we use to give good weaving qualities and have no trouble with the after processes of bleaching, dyeing, and printing. It is of great importance that manufacturers should consider the fact that there are many articles suitable for use in sizing of yarns, but which cause much trouble in bleaching and dyeing.

One point I wish to advance in this connection is the use of starch and tallow alone for sizing warps. It has been proved a failure many times, for the reason that the fats which they used were not saponified. In such cases after sizing, when the warp is cool, the fats remain on the surface of the yarn and if the weave shop is kept damp, the fat rubs off a little in the reed, and causes stains in the bleaching of the goods. Many of these stains do not show in the bleach; but they are plainly visible in the dyeing or printing.

The risk in using tallow is much greater than formerly, because nearly all bleacheries have abandoned the method of steeping the goods in water, before the liming process. There are many different systems of sizing which are well known. I refer to the formulæ contained in textile publications, but it is useless to discuss which of them are the best. To follow up such methods would require a high salaried man in each mill, who would thoroughly understand how to compound them, and it would be costly in other ways. There are many compounds on the market prepared by several manufacturers of sizings, all of which are claimed to be "the best." The great competition in this line of industry has resulted in cutting of prices and a lower standard of quality by several makers of sizings; all of which have come under my observation. The component parts of these compounds are generally unknown; but it is satisfaction to know that one or two reliable concerns are not ashamed to tell customers what they are buying. Some preparations contain from 15 to 20 per cent. solid matter, and some contain earthy materials, also sulphate of lead, sulphate of calcium, sulphate of zinc, and other dangerous materials. It is wise to steer clear of such stuff, for it is like paying for water and is very liable to cause trouble in the bleaching, etc.

Good sizing compounds are neutral, colorless, and transparent. They

should be perfectly soluble in water, and should contain at least 40 per cent. solid matter. The proper size to use on prints, or the finer qualities of goods, is that which does not interfere with the bleaching, etc. Pure sizing for weaving qualities, is all that is desired for converted goods. The sizing compound must strengthen the starch both in volume and adhesive power, which will also penetrate and give the yarn tensile strength, and contain sufficient softening material to offset the hardness and brittleness of the starch, thereby giving a smooth feel, which also prevents the cutting of the harness eyes.

Yarn for heavy sizing must be soft spun, and the size must be made of strong binding and filling ingredients, which will also give a soft full "feel." A good heavy sizing for medium or coarse yarns is made with starch or flour, and Arabol Gloy. The latter material combines readily with starch and flour, or with china clay, and acts as an assistant to penetrate and hold the size on the yarn, also gives a soft feel to the goods and prevents fungi growth or mildew.

Potato starch sizing is excellent for warps for napped fabrics, as it stiffens the yarn nicely, which is necessary to get an even, full nap.

The first session of the second day opened with a large attendance of members. The first paper read was by Philip Dana on "What Belting is Made of, and its Care," to be found in the Power Department, this issue.

After the reading of Mr. Dana's paper, the topical question, "What is the Superiority of Iron Beams over those of Southern Pine for Mill Floors?" was discussed. Many instances of the perils attending the use of iron beams in case of fire, were given, and although methods were shown by means of which this danger could be obviated, insurance companies are apt to discriminate against mills using iron beams in their structure. Louis Simpson, of the Montreal Cotton Company, said he found that the insurance companies did not allow their use, as though he had thought of using them in the construction of a mill, but upon consulting the underwriters, was told that the risk could not be taken. The tendency of iron beams to expand and twist when subjected to great heat, was remarked upon, and the Windsor Hotel fire was given as an instance of the bad effects of using iron beams in any building. The discussion closed with a seemingly tacit agreement that, in view of the present attitude of insurance companies towards the use of these beams, Southern pine was better fitted for mill floors, until some cheap and safe method of covering the iron beams could be brought into use.

The next topical subject brought up for discussion, was "What is the Best Method of Coloring the Inside Walls of Mills?" The members were united in agreeing that some form of whitewash was the best. Several members gave different recipes, and, at the suggestion of Louis Simpson, it was decided to ask all who have good recipes, to send them to the secretary, for enrollment in the minutes of the association.

"How Can the Card Room be Ventilated Without Undesirable Currents of Air?" was the next topic discussed, and the value of the different ventilating systems were canvassed. The method which seemed to find the most favor, as simplest in its construction and giving the most favorable results, was that of having windows made, with an upper transom, which will direct a current of air against the ceiling, thus supplying sufficient ventilation without causing a draught.

Papers were then read on: "Auxiliary Power Plants with Electrical Transmission at Grosvenordale and Lyman Mills," by Frank P. Sheldon, Providence, R. I.; "The Advantages of the Electric Driven Cotton Mill," by W. B. Smith Whaley, Columbia, S. C.; and "Fallacies Concerning the Electric Drive," by Sidney B. Paine, Boston, Mass., which will be found at length elsewhere, except the latter,

which will appear in the Power Department of our June issue. At the conclusion of these readings, a general discussion took place, upon the relative values of steam or water power, as compared with electric power, for use in the mill. This proved to be the most interesting discussion of this session. There were few members but had some question to ask Mr. Paine, or some experiment to report. Opinions were divided on minor questions, but all admitted that electricity would be the greatest factor of the future in operating mills, owing to the advantages it possesses over steam or water powers, in steadiness, evenness of running, etc. Instances were given of electrically driven looms and frames which had formerly been operated by steam or water power, and which now give a largely increased production and better material. This question, which finally was formulated into "Steam or Water vs. Electric Power," aroused so much interest and created so much discussion, that it was decided to continue the matter to the next meeting, when it will be discussed at still further length.

The last session commenced on time, and President Knight declared that, out of compliment to the Southern members present, the matters on the programme would be taken in reverse order. The last article on the programme being the topical question: "Have the Methods of Sampling Round Bales Proven Satisfactory in Practice?" was taken under consideration first. Mr. Ball, of the American Cotton Company, gave an address, upon the invitation of the association, on the advantages of the cylindrical lap bale. The secretary of the association read a round-robin letter from various cotton factors, giving it as their opinion, that the round bale would never be satisfactory, nor could they accept it, unless some way could be found by means of which the bale could easily be examined. They declared that the cotton ginner was bad enough at the present time, but, should he be allowed to adopt the cylindrical lap bale, with its inner consciousness almost unapproachable, spinners would never receive a bale of good cotton again. It was asserted that "spinners would as soon have a mortgage on a flock of black birds, as to trust the word of the average ginner." Mr. Ball answered the foregoing remarks by declaring that he would sooner trust the average ginner than the average cotton factor, affirming that the cotton factor was an obsolete and out of date personage. He said that, by the methods introduced by the American Cotton Company, the cotton factor was not needed, and that, in fact, the cylindrical lap bale gave a fuller protection to the manufacturer than the present system could possibly do. A cylindrical lap bale was then placed upon the platform, and Mr. Ball illustrated the ease with which a sample could be taken from it. Various objections made by different members of the association were met, and the question was then put by a member: "What would be the extra cost?" Mr. Ball answered that it is on the average of one-quarter of a cent per pound, and that this is more than counterbalanced in the saving of insurance, risk, freight, tare, etc. According to the supporters of this bale, all they ask is that the consumers shall pay for the increased amount of cotton they receive and the better condition of the staple. Hon. Wm. C. Lovering then gave a short address on the subject, following which Edward Atkinson delivered a speech on "The Impairment of the Strength of the Cotton Fibre Between the Field and the Cloth." At the conclusion of Mr. Atkinson's address, Prof. C. L. Norton, by invitation of the Board of Government, showed a working model of the machine which he has invented, to determine the loss in strength of cotton fibres, when subjected to the various processes employed in converting seed cotton into finished cloth. This was the first subject which drew universal

applause from the members of the association, and, considering the value of the invention and the amount of time and brain work used in constructing this machine, the applause was well deserved.

On the motion of Louis Simpson, the Board of Government were authorized to grant a sum, sufficient in their judgment, to reimburse Mr. Atkinson and Prof. Norton for the amount they have spent on this devise, and to further assist Prof. Norton in carrying out his researches. This was unanimously carried. A second motion was also made, that a sub-committee be appointed to supervise the expenditure of this money, which was also carried unanimously.

Mr. Atkinson then read a few extracts from his address on "Roller Ginning," followed by Mr. R. Derdeyn, who, by invitation of the Board of Government, delivered a speech on the same subject.

The other addresses, upon "Oiling Fly Frame Spindles," and the "Automatic Conveying of Cotton from Storehouse to Picker Room," were not read, as the hour was getting late.

It was decided to carry the discussion on the advantages and disadvantages of the round bale, over to the next meeting.

In the absence of the new president, Mr. Frederick E. Clarke, retiring president; Stephen A. Knight, delivered the closing address, and declared the meeting at an end.

The following officers were elected: President, Frederick E. Clarke, president Boston and Lowell Railroad; vice-presidents, Frederick C. McDuffie, treasurer Everett Mills and York Manufacturing Company; Henry T. Whitin, treasurer Paul Whitin Manufacturing Company, Northbridge, Mass.; directors, A. Tenny White, superintendent Manville (R. I.) Manufacturing Company, and Alfred E. Adams, agent Linwood Mills, Whitinsville, Mass.

The applications for membership were acted upon with the result of electing the following list of active and associate members.

FOR ACTIVE MEMBERSHIP.

Frederic Amory, Boston, Mass.; Louis B. Barker, Central Falls, R. I.; Jefferson Borden, Jr., Fall River, Mass.; Hervey Burnham, North Adams, Mass.; Frank H. Cotton, Hope Mills, N. C.; Bradford C. Divine, Chadwicks, N. Y.; Lewis Dexter, Jr., Milltown, New Brunswick; Frank H. Dwelly, Fall River, Mass.; Arthur C. Freeman, Waltham, Mass.; William J. Hadfield, Lawrence, Mass.; Effingham C. Haight, Fall River, Mass.; William D. Hartshorne, Methuen, Mass.; Franklin W. Hobbs, Boston, Mass.; Charles M. Holmes, Manchaug, Mass.; George A. Moody, West Warren, Mass.; Joseph H. Potter, Jr., Fall River, Mass.; Enos F. Rathburn, Montville, Conn.; Robert Stewart, Fall River, Mass.; John Sullivan, Fall River, Mass.; Timothy Sullivan, Fall River, Mass.; Joseph S. Tidd, Taunton, Mass.; Horace W. Tinkham, Fall River, Mass.; Robinson Walmsley, Fall River, Mass.; J. S. Wilbur, Glasgow, Conn.; James M. Young, Hamilton, Province of Ontario.

FOR ASSOCIATE MEMBERSHIP.

C. F. Curwen, Salem, Mass.; Redington Fiske, Boston, Mass.; F. A. W. Harris, Providence, R. I.; John Hogg, Boston, Mass.; W. C. Langford, Providence, R. I.; Arthur J. Warren, Fall River, Mass.; Stephen M. Weld, Boston, Mass.; W. W. White, Worcester, Mass., and A. M. Benson, Boston, Mass.

European Fall Lines.

No. 3.

(Reported by the European Pattern Supply Co., 32 Greene St., New York.)

The manufacturers of the Lausitz are to the greater extent the originators of novelties in fancy cassimeres and worsteds. If we follow the history of the principal manufacturing towns of the Lausitz, we would be surprised at the enormous progress which has been made there during the last fifty years. In former times the majority of the manufacturers in that district stood on the same basis with the American manufacturers of today, but for the past fifty years, conditions have taken a great change. In Forst and Spremberg, the manufacturer was accustomed to buy his wool in the month of May and June, and supply himself for the entire year, and he made his customary staple articles which were either sold directly from the mill or at the fairs in Leipzig, Frankfort, etc. This custom was followed year after year and everybody appeared to be satisfied with his production and its profits. The aforesaid change took a decided form about 1850,

when several young manufacturers, who had served their apprenticeship in English factories, established themselves in Cottbus and Forst and developed the experiences which they had gained abroad and, with the help of the first mechanical weaving machinery that was put in operation in Germany, manufactured decided novelties, such as had been made in the English market for some time. Other manufacturers have followed in the footsteps of these young intruders, and it is almost indescribable what immense success the entire manufacturing industry of the Lausitz has had since.

It is not saying too much that many of the manufacturers have shown greater skill and ingenuity than their English teachers. Anybody who will inspect the fabrics of Gustav Samson of Cottbus must admit that the same are perfect in the highest degree, and it can be observed that there is a careful study underlying each branch of manufacturing, such as construction of colors, designing, finishing, etc., and it is not surprising that every consumer of good woolen goods considers it an honor to have Samson's qualities represented in his line. But it is not Samson's alone who has attained the high standing in manufacturing, but there are hundreds of others who have followed him, and the very few who have not been successful do not cut any figure in the manufacturing world.

As the Lausitz predominates in the creation of novelties, so does Cottbus in the smaller district, and in consequence is the leading place of entire Germany. The last fall lines of this town, consisting of worsted and cassimere nouveautes, are ample proof for this assertion. It would lead too far to mention all the different makes and effects of this line, but we wish to say that amongst the great variety of beautiful combinations in colors and weaves in cassimere and worsted goods, there is hardly a single pattern that could be called superfluous.

In overcoatings, we find a great many covert patterns, and in the solid colored part of the line, we see colors that may be called absolutely new, such as delicate gray, mode and various shades of grayish brown and tobacco colors. Boucles, with very fine curls, are also being made for overcoatings, but we do not see such a variety of them in this line as we have seen in Aachen.

Forst, the German Manchester, is the heart of the German woolen industry. It turns out from three to four million pieces of goods per year. The large amount of manufacturing is due to the fact that goods of medium and low-priced qualities are made here principally, and the market is therefore entirely different from Cottbus. The manufacturers of Forst are also striving to put novelties on the market, but these are made in lower qualities and their more modest character permits the manufacturer to range them with staple articles, for which there is a considerably larger demand than for the rich designs in high-priced fabrics.

Spremberg manufactures still cheaper goods, and here we find a great consuming of shoddy, but no matter how cheap the stock is which is used for manufacturing, it is spun and woven so carefully that the cloth, when it leaves the factory, is an article which can be used, and gives warmth and satisfaction to its wearer, but does not fall apart after a few weeks, as is often experienced with the flimsily constructed, low priced fabrics of English and American manufacturers.

A few more conspicuous places in the Lausitz for good qualities are Peitz and Guben. In some factories of these places, we find goods of even better qualities than in Cottbus, but, as a whole, we find principally beavers, kerseys and castors. The three leading manufacturing towns of Saxony are Grossenhain, Crimmitschau and Werdau. The first mentioned place, to a greater extent, makes designs in wool with silk thread woven in in diagonals, croise and tricot long.

Crimmitschau and Werdau show their lines principally in velour and melton finish, and manufacture almost exclusively for the wholesale clothing trade. These goods are made in checks and plaids on dark grounds, and only a limited amount of patterns is found with light ground colors, such as tan and gray.

A great many more towns with a considerable amount of factories are found in Saxony, whose products, however, are not of particular interest to the American market.

Official Medal.

GIVEN BY THE NEW ENGLAND COTTON MANUFACTURERS' ASSOCIATION FOR MERIT.

The most important measure passed upon by the Board of Government of the N. E. Cotton Manufacturers' Association, during the past year, was the establishment of a medal, which we take pleasure in illustrating here with. This medal was decided upon by the Board after long continued and thorough investigation, both in relation to the precedents of other organizations, and the functions of this association.

On one side of the medal, as will be observed, is the name of the association and the date of its foundation and incorporation. In the centre, is a loom of the pattern in general use at the time of the foundation of the association, surrounded by a garland of cotton bolls, those on the right being Sea Island cotton, and on the left, upland cotton. The name of the association, in mural text, is girdled by a circle of hanks of yarn knotted together. On the reverse side, is seen a chaplet of oak and laurel leaves, symbolizing strength and honor, secured at the base by the American eagle with outstretched wings, the latter formed and framed for the tablet containing the name of the recipient, and the cause of the award.

The Board of Government established in 1895 a fund of one thousand dollars, the income of which was to be reserved as a resource for purposes beneficial to the association.

In the fiscal year of 1897 this was applied to furnishing the members with certificates of membership, and the expense of continuing the supply to new members will be inconsiderable.

During the past year the Board decided to establish the New England Cotton Manufacturers' Association medal and to use such parts of the income of this fund as may be necessary for the recognition of the merit in papers read before the association, and the acknowledgments of the worth of inventions and methods contributing to the advancement of the cotton textile art.

It is the purpose that this medal may be given to any person whose work has been, in their opinion, an advantage of sufficient importance to the purposes to which this organization is devoted in its broadest sense

including any papers read before the association, the production of any mechanism or processes in the fabrication, design, or finishing of cotton goods, comprising mill construction, the generation of power and its distribution, or any of the works tributary to the cotton manufacture. The medal will be accompanied by a suitable diploma executed by the president and secretary, setting forth the award and the causes for which it was made.

Indigo.

There has been so much interest taken in the matter of the protest of Wm. Pickhardt & Kuttroff against the decision of the Collector of Customs at New York as to the rate and amount of duties chargeable on what is called synthetic indigo, that the following extended abstract from the decision may be of general interest:

The article in controversy comes from the Badische Anilin & Soda Fabrik, of Ludwigshafen, Germany, and is described in the invoice as "indigo." It is imported in casks in a liquid state, is of a deep blue color with a slightly reddish or purple shade, and when agitated has the precise appearance of finely divided or pulverized vegetable indigo suspended in water, which precipitates when still for a time. Although repeatedly referred to as indigo in the form of paste or as indigo paste, it is not in strict sense in the condition of paste, not being of adhesive, glutinous or plastic composition, nor is it, as clearly appears from the testimony in the case the "indigo paste" of commerce, which is sulphonated indigo soluble in water.

It was returned by the appraiser as "Color (30 per cent.)," and was assessed for duty at 30 per cent. ad valorem under the provision in paragraph 58, Act of July 24, 1897, for "All colors . . . ground with water or oil or with solutions other than oil, not otherwise specially provided for in this Act 30 per cent. ad valorem." It is conceded by the protestants that it was derived from products of coal tar, and in that sense is distinguished from indigo produced from vegetable substances. They contend, however, that it is indigo, having been dealt in and used as such in large quantities in the United States prior to July 24, 1897, and since, and they therefore claim that it is exempt from duty under paragraph 580 of the present tariff act.

It is in evidence that between July, 1894, and July 24, 1897, the protestants imported some 53 thousand pounds of the article, and about 450,000 pounds since the latter date, which was sold, as imported, to numerous manufacturers of textile fabrics in different parts of the United States, all under the name of indigo or indigo J, and that it was admitted free of duty during that time and until the importation in question here.

The Treasury Department in synopsis 19,162, dated March 31, 1898, concurred in the conclusions reached at a conference which had then been recently held between the collector, the appraiser and naval officer at this port, to the effect that the article in question was undoubtedly indigo, could not be distinguished in any essential particular from Bengal indigo derived from plants, and was therefore entitled to free admission under the provision for "indigo" in paragraph 580 of the present tariff act. The Department, however, in synopsis 19,644, dated July 13, 1898, instructed the collector here to impose a duty of 30 per cent. ad valorem on indigo artificially prepared from coal tar products, "thereby giving importers an opportunity to carry the matter before the Board of General Appraisers."

The latter instruction was issued upon representations made by a committee of the Drysalters Club of New England, at the instance of a number of prominent importers of vegetable indigo and wholesale dealers in, and manufacturers of, other dyestuffs and chemicals at Boston, Philadelphia and New York, who were represented at the hearings of the case by the Board

by able counsel who joined with the counsel for the Government in the elaborate brief filed in the case. It was in accordance with the synopsis 19,644, that the importation in controversy was assessed for duty as hereinbefore stated.

We learn from recognized authoritative publications that long before the Christian era and until within a comparatively recent period the blue coloring matter termed "indigo" was obtained entirely from the leaves and twigs of a great number and variety of leguminous plants, chiefly of the genus Indigoferra, including the Indigoferra tinctoria, Indigoferra disperma, Indigoferra anil, Indigoferra argentea; and many other species, also from the genera Isatis indigotica, Isatis alpina, Polygonum tinctorium, Tephrosia appollinea, Eupatorium tinctorium, Ascleptis tingens and others, grown in the Indies, Spain, Egypt, China, Japan, Java, Arabia and South America, and from the well known woad or pastel plant (Isatis tinctoria), of England and the Continent, with which the ancient Britons dyed their garments and stained their bodies.

According to Allen's Commercial Organic Analysis, vegetable indigo "does not exist ready formed in the plants, but is produced by the decomposition of a glucoside called 'indican'" contained therein. The constituent on which the value of commercial indigo depends is indigotin, which "varies from 20 to (occasionally) 80 per cent., with an average of about 45 per cent. The only other constituent of tinctorial value is the indirubin or indigo-red, the proportion of which is generally between 3 and 5 per cent." It appears from high authority that the extraction of vegetable indigo from the plant, and its preparation for market are carried on, in Bengal and elsewhere, substantially as in ancient times, as described by Dioscorides and Pliny, and include maceration or bruising, fermentation, filtration, drying and other tedious and more or less complicated processes of manufacture, involving much labor and time, in instances 70 days or more. It varies greatly in quality, perhaps as much as in the sources whence obtained, thus differing from vegetable alizarin which was of definite character and derived from the one source only, the madder plant (Rubia tinctorium).

In the years 1868-69 the price, in this country, of madder alizarin was about $2.50 per pound. Following its successful production from coal tar the price declined from $1.75 per pound in 1871 to about $1.00 per pound in 1873. French madder (ground) was quoted in the New York market in 1873 at 7½ cents per pound, from which it had declined in 1885 to 2½ cents per pound. The price of madder roots also declined from 60 francs per cwt. at Avignon, France, in the year 1868-69 to 21 francs in 1874. Since then the price of synthetic alizarin in the United States has reached the low figure of 12 cents per pound, meantime vegetable alizarin and madder had become practically extinct as articles of commerce.

This marvelous achievement in coal tar chemistry and its benefits to consumers of these dye-stuffs throughout the civilized world naturally stimulated scientific effort toward the attainment of like results with respect to indigo, and the consequent deliverance of its consumers from frequent vexatious embarrassments, incident to crop failures and resulting violent fluctuations in price, from combinations and exactions of dealers in the article. It appears, therefore, that in the period intervening between 1870-1880, the synthetic production of indigo from coal tar was the subject of earnest endeavor by scientists, and its attainment, in 1880, appears from the following:

Professor H. E. Roscoe, President of the Chemical Society, London, in a paper read before the Royal Institution of Great Britain, in May, 1881, said, in substance: That he had more than eleven years before brought to the attention of his audience the discovery in synthetic chemistry of the

artificial production of alizarin, the coloring substance of madder, and that it was now his privilege to announce the attainment of another equally striking case of synthesis, namely, the artificial formation of indigo, by "Professor Adolph Baeyer, the worthy successor of the illustrious Liebig in the University of Munich. Here, then, we have another proof of the fact that the study of the most intricate problems of organic chemistry, and those which appear to many to be furthest removed from any practical application, are in reality capable of yielding results having an absolute value measured by hundreds of thousands of pounds." [Sterling]. The distinguished professor referred to the significant fact that Fritche as long ago as 1840 proved that aniline could be obtained from indigo, indeed that the name of that well known coal tar product (aniline) was derived from the Portuguese word "anil," used to designate the blue color of indigo.

The tariff act of March 2, 1861, exempted "indigo" from duty by that name simply. The Act of March 3, 1883 (the first tariff act passed after Baeyer's discovery of synthetic indigo) provided for the free admission of "indigo and artificial indigo." Paragraph 614 of the tariff act of 1890, provided again for the exemption of "indigo" from duty. The tariff act of 1894 provided for the free admission of "Indigo, and extracts or pastes of, and carmines." The pertinent paragraph of the "Dingley Bill" as originally reported, read: "Indigo, whether natural or artificially prepared." The qualifying words were however, subsequently stricken out, thus leaving the term "indigo," as it is in the present tariff act.

The contentions in the brief of counsel for the Government's side of the case may be summarized as follows:

(1) That the term "indigo" as used in paragraph 580 of the present tariff act is applicable to vegetable indigo only, imported in the form of cubes or lumps:

(2) That the article in question here is not the indigo of commerce because: (1) It is imported in paste form only, and (2) is not known to the trade as "indigo" simply, but as synthetic indigo, artificial indigo, indigo J, indigo B. A. S. F., or as indigo pure.

(3) That the term "indigo" as used in the present tariff act does not apply to the article in question because it was found and reported by the Government chemist not to contain indigo-brown, indigo-gluten and mineral matter, which are characteristics of vegetable indigo.

(4) That by the use of the phrase "indigo and artificial indigo" in the Act of 1883, the Congress differentiated vegetable indigo from that derived synthetically from coal tar. Consequently that the omission of the words "and artificial indigo" in the tariff act of 1890, and the rejection of the words "whether natural or artificially prepared" in connection with "indigo" in the "Dingley Bill," indicated that it was the purpose of the Congress to limit the exemption of the article from duty to that produced from plants.

Eight, of the eleven, witnesses who appeared on the Government's side of the case at the hearings before the Board were representatives of houses at Boston, Philadelphia and New York, who have long been in the business of importing and selling vegetable indigo, and other dye-stuffs and chemicals, and were of those who were instrumental in effecting the issuance of Department's synopsis 19,644. They testified, in effect: That the article they had known as indigo was produced from plants, and was in the form of cubic cakes or in lumps; that it was designated in trade variously as Bengal indigo, Madras indigo, Kurpah indigo, Java indigo, Manila indigo, Oude indigo, Tirhoot indigo, Guatemala indigo, or by other names, according to the country or district in which produced or whence exported; that they had never dealt in the article in controversy and their acquaintance with it was limited to seeing samples of it and to what they had

heard from others; that they had heard it called indigo J, indigo blue, synthetic indigo, artificial indigo and B, A, S, F indigo, and that they did not consider it the indigo of commerce.

The courts have repeatedly held that the commercial designation of an article cannot be established by witnesses who have never actually dealt in it.

Dr. T. B. Wagner, formerly chemist in the Government laboratory at this port, testified that he had returned the importation in controversy as "not identical with natural indigo" because, being in the form of paste instead of cubes or lumps it differed therefrom in appearance, as it did also in smell; and furthermore did not contain indigo-gluten and indigo-brown, also certain earthy or mineral substances usually occurring in raw or vegetable indigo. He agreed with Professor Chandler that the indigo-brown was of no practical value, yet did not consider it an impurity, and was of the opinion that "the gluten plays a certain role in the application for dyeing." He further testified in substance that the article subject of protest (except the water) was almost pure indigotin with indirubin, and a percentage of ash below that found in commercial vegetable indigo, but that it was not commercial "extract of indigo," and would not be if separated from the water, not being soluble.

The two other witnesses for the Government testified to the effect: That they were practical dyers and had used the article in question for a short time. One said he used it in the same vats as vegetable indigo, but with less reducing agent, and that "the shade was much reddisher" than they had been getting from vegetable indigo, and the cloth was rejected on that account. The other said that when he used it in a woad vat he did not get any of the results obtained from vegetable indigo, and that when used in the hyposulphite vat the results were not entirely satisfactory, yet the material dyed with it "went through the works," having gone into blue goods for the Government.

(To be continued.)

The Silk Association of America.

The board of managers of the Silk Association of America has unanimously re-elected Franklin Allen secretary at the salary of $5,000. The following standing committees were appointed:

ARBITRATION COMMITTEE.

Geo. L. Montgomery, Chairman.
Div. A.—Geo. L. Montgomery.
Div. B.—Russell Murray.
Div. C.—W. E. Eaton.
Div. D.—H. A. Van Liew.
Div. E —John E. Cowdin.
Div. F.—A. G. Jennings.
Div. G —Vacant.
Div. H.—C. L. Auger.
Div. I.—Albert Blum.
Div. J.—Benj. Eastwood.
Div. K.—Jacques Huber.

COMPLAINT COMMITTEE.

Arthur Ryle, Chairman.

Bernard Loth.	Charles F. Homer.
John Grimshaw.	B. A. Armstrong.

COMMITTEE ON ADMISSIONS.

H. A. Van Liew, Chairman.

C. L. Auger.	James Erskine.
Wm. Skinner, Jr.	Ernst Grund.

COMMITTEE ON REVENUE LAWS.

Jacques Huber, Chairman.

F. W. Cheney.	Richard Rossmassler.
Catholina Lambert.	Charles F. Homer.

COMMITTEE ON INFORMATION AND STATISTICS.

Jerome C. Read, Chairman.

Jacob Weidman.	W. T. P. Hollingsworth.
T. B. Thompson.	Theo. Staubli.

LEGISLATIVE COMMITTEE.

Gen. Joseph W. Congdon, Chairman.
Benj. Eastwood.

SILK CONDITIONING COMMITTEE.

M. M. Belding, Jr.	J. E. Pagnon.
H. J. Hanssen.	Arthur Ryle.
Leon Hess.	Alfred Schiffer.
Jacques Huber.	Geo. Singleton.

H. A. Van Liew.

—E. J. Barnette has been appointed superintendent of the Gaffney (S. C.) Cotton Mills.

—Edwin P. Northrup, for over twenty years overseer of spinning in the mill of the China Mfg. Co., Suncook, N. H., has severed his connection with that company, and William Hawkins, of Salem, Mass., has taken charge of that department.

COTTON DEPARTMENT.

23190K
Apr. 11.98.

American Cotton Spinning Machinery.

ARTICLE X.

CHARLES CLIFTON HEDRICK.

(Copyrighted.)

The wire teeth in card clothing are set into the foundation in three different ways, and are known as open set, which is seldom used at the present time, the twill set, used for the flats and the rib set, used for the cylinders

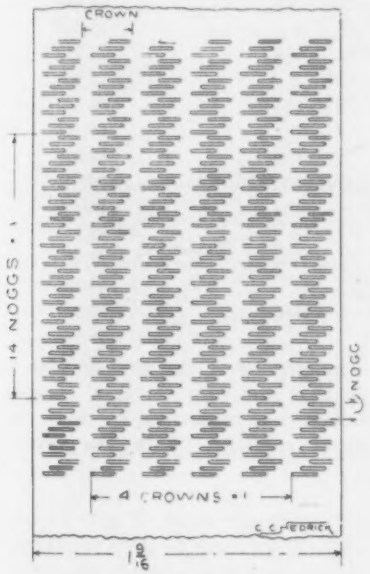


FIG. 69.

and doffers. The effect on the face of the clothing is about the same, as far as the arrangement of the points is concerned, no matter which style of setting is used.

A plan of the back, or crown side, of a strip of fillet, with the rib setting, is given in Figure 69. The crowns, extending across the width of the fillet, are four to the inch, consequently across a strip of one and one-half inch width there are six crowns, and, as the foundation is about one-sixteenth of an inch wider than the wire surface, a one and one-half inch fillet covers a surface about one and nine-sixteenths wide.

The noggs, which run lengthwise of the fillet, are from ten to twenty-eight to the inch. A nogg consists of a group of three crowns and, of course, to each crown are two points. The points per square foot may be found in the following way:

Rule: Multiply together the number of noggs per inch, the crowns per inch, crowns per nogg, points per crown and the number of square

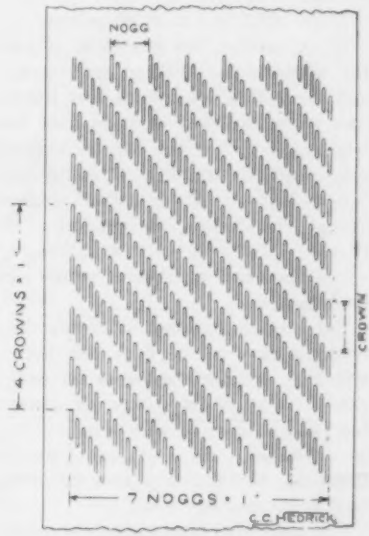


FIG. 70.

inches in a square foot. For example: In Figure 69 there are fourteen noggs to the inch, the points per square foot would then be $14 \times 4 \times 3 \times 2 \times 144$ or 48,384 points.

Each nogg added per inch increases the number of points per square foot 3456. Thus, by multiplying the number of noggs per inch by this number, the points per square foot can be readily found.

Example: 3456×14 (noggs) $=$ 48,384 points per square foot.

The twill set is shown in Figure 70.

The crowns extend lengthwise of the sheet and are four to the inch. The noggs are counted across and are from five to fourteen per inch. In each nogg, there are six crowns instead of three, as in the rib set, but the points per square foot can be calculated by the same rule. To illustrate this, it will be seen that in Figure 70 there are only seven noggs per inch but, as there are just twice as many crowns to each nogg, the points per square foot will be the same as in Figure 69, which has fourteen noggs per inch.

Example: $7 \times 4 \times 6 \times 2 \times 144 =$ 48,384 points.

For the twill setting, each additional nogg per inch increases the number of points per square foot 6912.

Thus: $6912 \times 7 =$ 48,384 points.

When carding low grades of cotton, the wires of the clothing are coarser, and the points per square foot fewer, but, when the card is to be used for long staple cotton, the wire is slightly finer, and the number of points per square foot, on all the clothed surface except the leader, is generally increased. No rule can be given by which the exact number of points can be determined.

For medium grades of cotton, the clothing used on the flats and doffer, which is usually the same for both, has 69,120 or 72,576 points per square foot, and number 33 wire is used. For the cylinder, the clothing contains 62,208 to 65,664 points and the wire used is number 32.

The following tables give the points per square foot for both rib and twill set clothing.

RIB SET CLOTHING.

Noggs per inch.	Points per sq. foot.
10	34,560
11	38,016
12	41,472
13	44,928
14	48,384
15	51,840
16	55,296
17	58,752
18	62,208
19	65,664
20	69,120
21	72,576
22	76,032
23	79,488
24	82,944
25	86,400
26	89,856
27	93,312
28	96,768

TWILL SET CLOTHING.

Noggs per inch.	Points per sq. foot.
5	34,560
5½	38,016
6	41,472
6½	44,928
7	48,384
7½	51,840
8	55,296
8½	58,752
9	62,208
9½	65,664
10	69,120
10½	72,576
11	76,032
11½	79,488
12	82,944
12½	86,400
13	89,856
13½	93,312
14	96,768

In considering the kind of wire to be used for card teeth, a question arises concerning which there are many opinions. With the leather

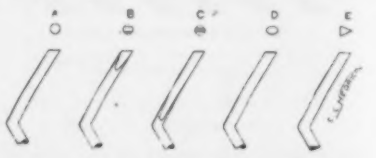


FIG. 71.

foundation, which is used for the old-style stationary flat cards, it is the universal practise to use round iron wire, but with the modern revolving flat card, this kind becomes dull very quickly on account of the increase in production. The wire, used at the present time, is mild steel wire, which has been previously subjected to a process of hardening and tempering. It is claimed by many that the round iron wire tooth is preferable, where

quality and not quantity is desired, as it deals more gently with the fibres than hardened wire, consequently they can be given a more thorough carding without excessive injury. The various kinds of wire used are shown in the plan and elevation in Figure 71.

The one marked A is the ordinary round wire. B represents the so-called needle pointed, or side ground, wire, and is made from wire of round section by grinding two sides, for a short distance below the point. C is the plough ground wire, also made from a round section by grinding away on opposite sides about fifty per cent. of its original area, as far as the knee. The grinding is done by drawing the fillet over a flat surface, crown side down, the teeth passing between a series of emery discs. The sort of wire, marked D, is double convex and is oval in section. E is made triangular in section by rolling, and is used for napping machines, which are to raise or nap the surface of cotton goods to imitate flannel.

With regard to the respective merits of needle pointed and plough ground wire, the latter seems to find the most favor, as, at the present time, it is used almost wholly for the revolving flat card. How much better results are obtained with it, is a hard matter to decide, but it certainly affords a trifle more space, between the wires, for the reception of dirt, nep and short fibres.

When the card is first put in operation, the strippings are hard to remove from plough-ground wire, but after the sides of the teeth have become smooth, by constant stripping, it can be done much easier and cleaner than with any other wire.

It is necessary to grind the cylinder and doffer after they are clothed, before the card can be made to work successfully, the first grinding requiring generally about ten days. This depends upon the condition of the clothing. If the wires are too hard, and some of them higher than others, the time necessary for grinding is often much longer.

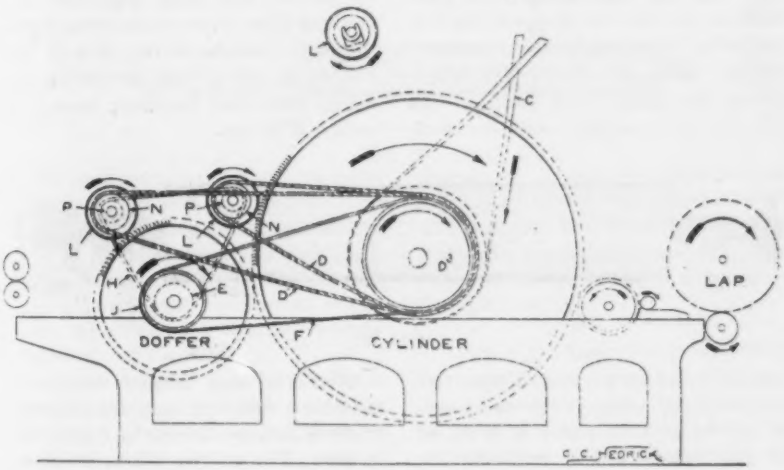


FIG. 72.

After the first grinding, it is necessary, in the ordinary running of the card, to grind the cylinder and doffer about once in four weeks. In carding long staple cotton, the time is reduced to a period of three or even two weeks, while in many cases once in six to eight weeks is as often as is necessary. The period between grinding operations oftentimes depends upon the ability of the grinder to perform his allotted duty rather than the actual need of the clothing. It is con-

sidered that frequent and light grinding is better than to wait until the card wires have become so dull that a very severe grinding is necessary to restore the points.

Figure 72 shows a side elevation of the card with the grinder rolls in position. The lap is withdrawn and the cylinder and doffer are stripped and brushed clean. The card is run until all the flats have passed the stripping brush and comb and have been made clean. The main belt C is then changed and the cylinder is run backwards, or in the opposite direction from that which is required in carding. The side shaft is slid out of gear and the barrow bar dropped, the doffer being driven by a belt F, and pulley J, from the Pulley D^3, which drives the leader when carding. On the end of the grinder rolls are score

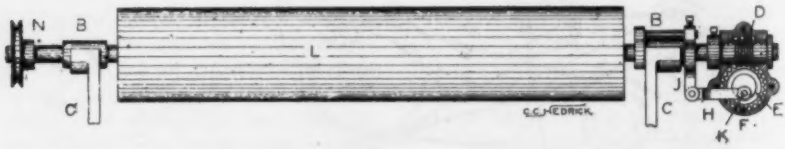


FIG. 73.

pulleys N, which are driven from two scores in the pulley D^3, by the bands D and D. A score pulley E is placed on the opposite end of the doffer for driving the traverse motion for the grinder rolls, by means of the band H, and pulley P.

For the first grinding, the long roll grinder, shown in Figure 73, is used, after this, in the periodical grinding, unless the card wires have become jammed or badly worn, the long grinder is seldom used.

The long grinder consists of an iron seven inches in diameter, which extends across the whole width of the surface to be ground. The roll, which is wound with emery fillet, is supported at either end by bearings B, which are mounted in the grinder brackets C. On one end is a score pulley N by which the roll is driven, and attached to the other end is a worm D, which drives a worm gear E. This gear is enclosed in a case F, which is shown in section, and which forms a bearing for it to turn in. In the hub of the gear is a pin K, which is set eccentrically, so that as the gear revolves, this pin describes a circle of about three-eighths of an inch radius. Attached to the pin is one end of a yoke H, the other end of which is fastened to a downward projecting arm J of the bearing. The revolutions of the grinder roll cause the worm gear to turn, and, through the pin in its hub and the connecting yoke, the roll is given a movement endwise of about three-fourths of an inch. This is done to prevent the high wires of the clothing from receiving grinding, from the same portion of the face of the roll, at all times, thus preventing the emery fillet from becoming worn and hollow in places.

After the long grinder has been used for a sufficient time, the short or traverse grinder, shown in Figure 74, is used. The grinder roll L, which is of the same diameter as the long grinder, is about four inches wide on the face. It is mounted upon a shell M, which has a slot D, extending throughout its length. Within the shell is a reciprocating screw A, to which the grinder roll is connected by a dog E, which slides in its threads. A score pulley N, by which the shell is driven, is fastened to one end, while the screw is driven from the other end of the shell, by a train of gears H, J, S and T, which have 22, 16, 15 and 23 teeth respectively. H is fastened to the shell and drives J which is compounded with S and runs loose on a stud B. T is fastened to the screw and is driven by S. The gears are enclosed in a case F, which, to prevent its turning, is fastened to the grinder

bracket C by a lug. By this means, the shell, which carries the grinder roll, is run at a faster speed than the screw, thus causing the grinder roll to move longitudinally along the shell, and, as the screw is cut with right and left hand threads, a reciprocal movement is given to the grinder which causes it to move back and forth, from one side to the other of the surface being ground.

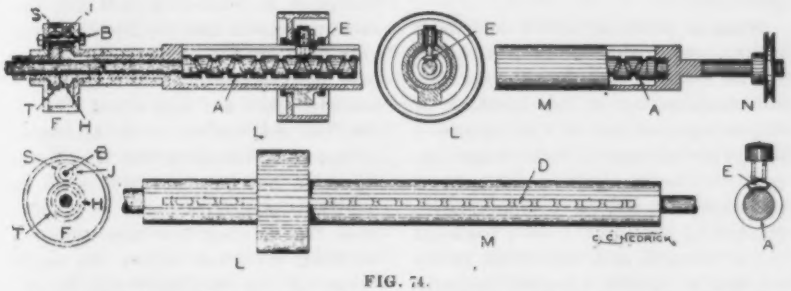


FIG. 74.

For each 100 revolutions of the shell, the screw is caused to turn 89.67 revolutions, in the same direction, which is 10.33 revolutions less than the shell, and as the screw is one and one-half inches pitch, 10.33 revolutions would move the grinder roll 15½ inches along the shell.

Another style of traverse grinder is shown in Figure 75, which consists of a roll L, a screw A, a dog E and a shell M with a slot D, all of which are the same as on the grinder previously shown. On one end of the grinder is a pulley N, which drives the shell, while on the other end is a similar pulley P of slightly different diameter. The shell and screw are thus run at different speeds and the roll is traversed to and fro on the shell. This style of grinder requires the pulley E and band H, as shown in Figure 72, to drive the screw for the traverse.

The surface speed of the cylinder is about 2275 feet per minute, and that of the doffer is 1921 feet per minute. The surface speed of the grinders is about 900 feet per minute, in the opposite direction from the cylinder and doffer, thus giving a total surface speed for the cylinder grinder of 2275 feet plus 900 feet, which is 3175 feet per minute, and for the doffer it is 1921 feet plus 900 feet, which is 2821 feet per minute. This is considered as high speed as hardened and tempered steel wire will stand. The doffer is run at a slightly slower surface speed, as it does not require as much grinding as the cylinder.

—James B. Driver, for several years boss carder and spinner at the No. 1 mill of the Hope Mills Mfg. Co., Hope Mills, N. C., has been appointed superintendent of the Cumberland (N. C.) Mills.

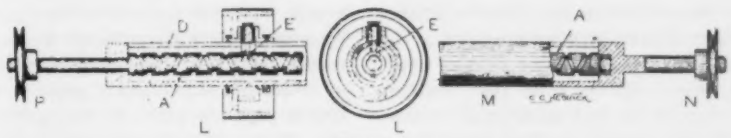


FIG. 75.

—Thomas F. Burke, of Glenville, Conn., has been appointed superintendent of the Chambersburg Woolen Co.'s mill, Chambersburg, Pa.

—Andrew Dexter, for twenty-two years boss carder at Talcott Bros.' mill, Talcottville, Conn., has resigned. Henry Brooks, of Lafayette, R. I., is his successor. Mr. Dexter intends farming in Vernon Centre, Conn.

Depreciation.

Paper by Joseph Nasmith, Manchester, Eng., read at the April meeting of the New England Cotton Manufacturers' Association.

There is no question on which there is such divergence of opinion, alike as to what is meant by the phrase nor, when that is agreed upon, how the operation is to be conducted, than depreciation.

What is depreciation? Primarily it is, of course, that allowance which should be made to cover the inevitable deterioration in any machine or article used, so that at the expiration of the period when it is no longer capable of economical employment a sufficient sum will be accumulated to replace it. In short, it is a payment out of revenue of a sum equal to the amount of capital absorbed in earning the revenue. In a sense this is a reserve fund, and should be treated exactly in the same way as the latter—that is, the amount set aside should be rigidly reserved, in order that it will be available for the purchase of the machines or articles which need replacement at the period when that it needed.

It is a common practice to deal with the allowance made for depreciation merely as a matter of account; but it is only a sham unless the actual sum so accumulated is at the termination of the predetermined time available either in cash or kind—preferably the former. A reserve fund is thus created, which differs from that ordinarily known by that name only because it is ear-marked and set aside for a specific purpose, the ordinary fund being available for any of the purposes of the business. The charge for depreciation is one which constitutes a special expenditure for a specific purpose, and must be so regarded. It is, in its essence, reserved profit, and as such should be tangibly represented either in cash or in some other form equivalent thereto.

There are, however, other considerations of importance in the case which are more complex. Primarily, as was said, depreciation is an allowance for the natural deterioration of the machine or utensil, which means capital expended, and in this form should always be made. As to the amount of the allowance, this depends on many conditions. The writer may be excused if, under the special circumstances, the illustrations given are confined to textile factories, although it may be truly said that the same principles underlie all cases, and only need special application. In the case of a machine it is requisite to consider that not only does it wear out, but that owing to the efforts of inventors and constructors it may become, if not obsolete, not equal to machines of a later date. It is quite clear that in some few cases where a startling invention occurs the whole value of any machine may be destroyed at one stroke; but this is an extremely rare—nay, almost unknown—occurrence. As a rule, the work of evolution proceeds in stages, sometimes quickly, sometimes more slowly; so that the unfortunate manufacturer does not suddenly find his machinery and plant rendered obsolete and of no value. But it is obvious that, however slow, this factor is one to be reckoned with, and does undoubtedly diminish the value year by year.

As an example of what is endeavored to be enforced, take the spinning frame. The old throstle or flyer spinning machine was—although in some respects the best ever used—incapable of producing more than a given quantity of yarn per hour. In consequence the efforts of inventors were turned to other modes of continuous spinning, and the ring frame was evolved. At first, owing to imperfections in the method of manufacture, the gain was not large, and was to some extent diminished by the comparatively great power needed to drive the machine, and the frequent breakages. The great conception of Sawyer, that it was possible to obtain a point of support high up the bobbin, speedily led to improvements, and the com-

bination of this principle with that of a self-contained spindle, which was the work of Rabbeth, carried the process further. But evolution was not yet at an end, and the application of the humming-top principle to the spindle gave a further impetus to the productive capacity of the machine. Moreover, while the inventor was busy, the constructor was not idle. Grateful as we ought to be to those whose conceptions have led to the evolution of the best forms of spindle, it is certain that at least as much is due to those able constructors whose constant vigilance and effort have so improved them as to add considerably to their value and efficiency.

The instance given shows that changes take place gradually, but it is quite clear that a spinner whose mill was equipped with frames having flyers would find its value much diminished on the introduction of ring spinning, and similarly would suffer proportionate loss if, having put in machines fitted with the common ring spindle, the newer type became an operative success. Further, the diminution in value is affected not only by the increase in the working velocity of the spindle, but also by the greater efficiency, owing to better construction, which leads to a greater continuity of work. An increased production, at all approaching the amount arising from the introduction of ring spinning, renders it imperative, in the face of competition, that the new instrument shall be adopted, and thus, unless it can be applied to existing machines—utilizing some of the parts—destroys the entire value of the latter, except that of the material.

Let it be assumed that a still further step is taken. It is common knowledge that many attempts have been made to spin yarn on the bare spindle of a ring frame. Hitherto success has not followed any of these efforts, but let it be assumed that someone solves the problem. Part of the cost of a ring mill consists of the bobbins which are perforce used. This at least would be rendered unnecessary, and the bobbins would cease to have any value in this connection. Further, let it be assumed that in order to produce cops on a continuous spinning frame a radical change is made in the character of the spindle used so as to obviate the necessity for a ring and traveler; it is clear that the value of existing machines would at once suffer diminution. Much more striking would be the effect if some change in design resulted in the capacity to spin much finer counts than is possible on a ring frame, while retaining the continuous principle. This would be little short of a revolution, and would lead to an enormous diminution in the value of mule plants.

There can be no doubt, therefore, that in considering the question of depreciation, it is as essential to take into account fully not merely the deterioration arising from wear and tear, but also the decrease of value consequent upon the production of new mechanical contrivances of greater power and capacity. These considerations apply in a lesser degree to buildings, but they do apply, because a given class of machinery is best arranged in a building of specific dimensions which may not be the best under other conditions. For instance, it is customary to provide so many cards and speed spindles for a given number of spinning spindles. It needs no demonstration that an increase in the productive capacity of any of these will affect the required number of the others, and that where a building has been designed to hold conveniently and most economically the specified machinery, it will not be so well adapted under the changed conditions. It is quite true that this consideration has not so much force in the case of buildings as it has in that of machinery, but it is not entirely to be lost sight of, as will be readily admitted if a mental comparison be made between the mill building of twenty years ago and that of today.

Having thus laid down the principles of the subject, it will be easy to deal with their application, although there are many considerations of importance to deal with.

In the first place it is evident that the amount allowed for depreciation must always partake of the nature of an estimate. It is quite true that, in some cases, past experience will enable an approximately true, estimate to be made of the loss from wear and tear, but even this is largely affected by changes in form or construction leading to superior velocities. It is, however, equally certain, that not even an approximately true estimate can be formed of the diminished value likely to arise from new inventions or improvements in construction, because that would necessarily be prophetic and not based upon any definite data. There is no doubt that an older and inferior machine at a certain value may be considered equal in productive capacity to a newer and superior one at full value, but it will be found that a full review of all the circumstances will lead to the conclusion that the value must be very low.

Having thus formulated the principle underlying the subject, it is necessary to deal now with the correct mode of estimating the amount which is required to provide for the loss of capital which follows upon the use of a machine. It is customary to fix a definite percentage of the value of the machine or building and deduct it from the value year by year, the percentage being fixed by assuming a definite life for the machine. Thus it may be assumed that a speed frame has a life of 20 years, so that a deduction of five per cent. yearly from the original value will at the end of that term provide a fund to purchase a new machine of equal value. Such a procedure is simple, and hardly requires explanation; but while safe so far as wear is concerned, it does not meet all the conditions. Further, it may well be that although a life of twenty years may be fairly presumed for a speed frame, it is not equally safe to fix the same period in the case of a loom. In other words, while the fixing of a single rate to cover the depreciation of all machines may be convenient, it is far from being accurate because some wear faster or tend to become less efficient more quickly than others. For instance, compare the action of a spinning frame with that of a loom. In the one the motion, although rapid, is continuous, and comparatively free from shocks; in the other, during the whole period of work, the motion is intermittent and violent. It is obvious that in the one case the conditions as to wear are favorable, while in the other they are unfavorable. Thus, the character of the machine, the work it has to do and the care bestowed on it have a great influence upon the question of depreciation, and render it necessary to consider these factors in fixing a charge. It is also desirable that the position in which a machine is placed should be considered, as in some cases there are local circumstances, such as damp or dust, directly tending to a depreciation of the machine. It is therefore essential not only to look at the matter in bulk, but also to consider the machines in detail, in order to ascertain whether one wears out more quickly than another, so that the proper allowance may be made in each case. In a spinning mill there is not much difference in the rate of wear of the various machines, because they are all run at regular speeds and without shock; but it is clear that even in this case a drawing frame is not liable to deteriorate so rapidly as a mule or a picker.

While the working of a machine tends towards a diminution of its life, the repairs upon it from time to time tend to an increase of the latter. It is thus necessary to make some provision in the estimation of yearly value for the effect of the expenditure on repairs. It should be borne in mind that the effect on the value, measured by an increased capacity of

the machine for work, does not always coincide with the money cost of repairs. More money may be spent on the latter than represents the value added to the machine, for while there is, beyond doubt, an increase in value, it may not be equal to the expenditure. The general effect of repairs is, however, to extend the life of the machine, and looked at merely from the standpoint of wear and tear, they should be charged as an offset to the depreciation in the year when they occur.

On the other hand, extensive repairs when the machine is old do not affect the question of its comparatively diminished value in view of improvements made in the design and construction of similar machines during its life. This is a factor to which it is impossible to give any definite yearly value, but it is one to be reckoned with, nevertheless. It can only be taken into account properly by deducting periodically a special charge, but is met to some extent by the decreased value of the machine arising from the operation of the regular charge.

It is urged, therefore, that there are many considerations to be taken into account in reckoning depreciation. These are:—

(1) The loss of capital by the natural wear and tear occasioned by work and by neglect or carelessness.

(2) The addition to the value at any given period which results from effective repair.

(3) The character of the work to be performed, and its effect upon the construction, operation, and amount of wear of the machine.

(4) The loss of capital caused by a decrease in the relative value owing to the introduction of superior instruments capable of more economical results.

In fixing the amount set aside for depreciation, we are at once met with a bone of contention. Shall the fixed amount be deducted yearly from the original or depreciated values? In other words, shall the life of the machine be taken as the period during which its cost shall be provided for, or shall there be at the expiration of that time a residual value which is equivalent to an extended life? It is quite certain that every machine which is replaced has some residual value. The material of which it is composed is worth something, and to that extent the absolute wiping out of its value in a given period is unjust. Generally speaking, however, the amount is not large, and may in any case be allowed for in making the calculation of the yearly allowance.

It may be fairly argued that the plan of deducting equal yearly instalments tells very heavily when the machine is worn and is less effective, while the deduction of a diminishing yearly sum depreciates sufficiently at the beginning, when the machine is at its best, and less after its working value is decreased. While this is true, it is purely a matter of account; and it is only permissible to adopt the plan named when the residual value at the expiration of the fixed period is only equal to that of the material. For instance, if a machine be valued at £100, and is depreciated at 5 per cent. per annum on that amount, at the expiration of 20 years the cost is wiped out. If now the percentage be only deducted from the diminished value annually, then at the end of the time named there is still 36 per cent. of the original value remaining. Now, it is obvious that no machine is worth at the expiration of such a term 36 per cent. of its original value —at any rate, no textile machine is— so that the method of computation named is of no value. If, therefore, the allowance is to be deducted from the depreciated amount yearly, then the rate must be higher at the beginning of the term than at any later period, and must, indeed, be on a diminishing scale throughout the whole period, in order to reduce the value to its proper level. On the whole, it is better and simpler, considering the purpose of depreciation, to deduct annually a fixed sum from the orig-

inal cost, so that there may be some period when the account will close.

There is one other matter which deserves special consideration, namely, the question of how to charge loose tools or accessories. In connection with all textile machines there are always a number of accessories, such as bobbins, skewers, skips, shuttles, etc., which, while not being part of the machine, are yet essential to its working. It is idle to charge these to capital as plant, and wherever this is done the account will not be kept properly. They wear out much more quickly, and require renewing more frequently, than the machines in connection with which they are to be employed. So that, if they are treated as plant, they require a much greater amount written off annually. The proper way to treat them is to catalogue them at every stocktaking, charging against revenue all additions made during any period, and valuing them as a special item for use in a going concern. This system has the advantages that it gives a check on that inevitable leakage which always takes place in a manufacturing concern, and provides for the renewal of all accessories out of the yearly income.

It is becoming the practice in the English cotton trade to charge a definite yearly sum to depreciation, instead of a percentage, care being taken to make it adequate.

Loose plant and accessories should be charged against revenue, and not counted as plant, and care should be taken to keep them up to full value year by year.

A Safety Device for Pickers.

The liability to accident from carelessness while the beater is uncovered is well known, and manufacturers will be glad to learn of a simple, inexpensive, yet effective, device for preventing such accidents. As a result of a mishap of this kind in the picker room of the Chicopee Manufacturing Co., some few years ago, by which a man lost his right arm, the overseer, Mr. Ward, and his second hand, Mr. Curtis, have invented a device which locks the driving pulley while the beater is uncovered, making it impossible to turn the pulley until the cover is replaced, and equally impossible to uncover the beater until the pulley is stopped. It works most successfully and obviates the possibility of accident from this cause. The Chicopee Manufacturing Co. inform us that they will gladly show its operation to any visitors, for, although they have no financial interest in the device, they would be glad to see it adopted for humane reasons.

Khaki.

A patent has been taken out by Gartside & Co., Limited, of Manchester, England, and William Warr, of Stalybridge, for dyeing khaki shades on vegetable fibres. The main process consists in giving the goods first an acid bath of a chromic or a ferric salt, or both. The oxides are then precipitated by passing the stuff through a bath of alkali. The color is thus produced, and is due to chromic or ferric oxide, or both. It is, however, though fairly fast to alkalies, not sufficiently so to acids. Hence the goods undergo a further treatment with boracic acid or ammonium borate in a bath or by padding and steaming. The best process is to pad on a solution consisting of about 5 oz. of boracic acid and 12 oz. of 25 per cent. solution of ammonia to 2 gal. of water. A steaming for about twenty minutes concludes the process.

—R. M. Griffith, formerly superintendent of the Highland Park Mill, Charlotte, N. C., but for the last two years superintendent of the Gloucester (N. J.) Cotton Mills, has taken charge of John Sidebotham's Langdell Mill, Frankford, Philadelphia, Pa., where twenty looms are running on tapes, wick and bindings.

SILK DEPARTMENT.

Silk Manufacture from the Cocoon to the Finished Fabric.

A SILK WEAVER.

The literature on silk manufacture is not copious and comprises the following works: Ure's Dictionary of Arts, Manufactures and Mines, Article Silk; Gilroy's Art of Weaving; Brockett's Silk Industry in America; Ruegg's Silk Calculator; Wolfenberger's Theory of Silk Weaving; Hurst's Silk Dyeing, Printing and Finishing. There are some others but these are the most important.

The most efficient superintendents I have met have been weave-room graduates. If any trouble, from any cause, arises in a weave-room, and the overseer cannot locate it, whether it be in his own or some preceding department, he lacks the necessary qualifications for the position. These qualifications make him a practical manufacturer. After the reasoning faculties have been sufficiently developed, man acquires knowledge by comparison, proceeds from the known to the unknown, and the Textile World being an old exponent of the cotton and wool manufactures, it may be inferred that most of its readers have a knowledge of some, if not all of the processes required, so a knowledge of the processes required in the manufacture of silk may be best acquired by comparing them with those of cotton and wool.

Nature has endowed the sheep with the power to produce for itself a warm covering of wool. Man appropriates this. Nature has also endowed a certain kind of caterpillar with the power to store within itself the material and from this to build for itself a little house for shelter and protection while changing from a caterpillar to a moth. Man appropriates this also and it becomes the cultivated silk of commerce. As wool is sorted by trained hands and eyes into the different kinds suitable for the different purposes for which it is used, so are the little houses or cocoons sorted for the same reason, having been subjected to oven heat or steam to kill the caterpillar before sorting.

Here is a parting of the ways, for no other material used in the textile manufactures has anything in common with the next operation on silk. The long attenuated gummy thread of the cocoons has nothing in common with the fibres of cotton, wool or flax. Imagine a fibre 750 or 1150 feet long! A more appropriate name is filament, as used by Dr. Ure. The outside as well as the innermost part of the cocoon, next the silk worm, is of a fibrous nature and called floss silk, which is carded and spun same as cotton. The best cocoons have the least, the poorest the most floss silk. In order to get the filament from the cocoons the floss is removed and the cocoon put in water, kept hot enough by a charcoal fire or steam to soften the gum. The cocoons are then dabbed with a whisk to find the ends of the filaments, and from 3 to 13 of them, according to quality of cocoons used, are put together to form one thread or single, which is wound onto a reel. There is no twist on those threads. The gum on each filament is soft as it leaves the hot water, and the threads being rubbed together and the gum hardening as they pass to the reel, the filaments in each are kept intact. It is probably this untwisted state which gave it the name of raw silk. After reeling, the silk is made into bundles much the same as cotton, and becomes the raw silk of commerce.

Before the Civil War, considerable raw silk was produced in the United States. Since then all of it has been imported. Here the ways meet again, but the processes required resemble those on cotton. What would common

sense suggest should be done now? The threads have no twist and dyeing or bleaching would reduce the skeins to floss silk, so the threads must be twisted or put in the same condition as cotton yarn, and the place where this is done is called a throwing mill. The raw silk skeins are put on swifts or cats, as they are called in some places, and the yarn wound on spools same as cotton. The machine on which this is done is made a little different from the cotton spooler. Instead of a fair sized spool being placed astride of a metal drum, a smaller one is put on a core or spindle which has on one end a piece of wood like a cotton sewing thread spool with the ends cut off. This rests on a driving wheel with a flat rim about ¾ inch wide, just wide enough to give sufficient power to wind the silk on the spool when nothing holds it. When the thread becomes fast it is strong enough to prevent the rotation of the spool till the attendant releases it, thus few if any knots are tied. The same kind of machine is used to wind the dyed skeins on, spools for warping mills, pirn frames or quillers, as they are called by silk operatives. The doubling and twisting is done on a machine constructed on the same principle as a ring spinning frame. After bundling, the gum on the raw silk becomes soft from heat, then after cooling, the skeins and threads are matted together, so they have to be steeped in warm water, then put in the extractor before they will wind off.

If a throwster buys raw silk on his own account, he makes it up into the standard yarns generally used by his customers, or waits for orders. If he throws on commission, he follows orders sent with the yarn. After being twisted, doubled and reeled, the yarn is ready for the dyehouse.

If a person going into a silk dyehouse be familiar with a cotton dyehouse, he will see little, if any difference. There are two peculiarities in silk dyeing, the preparation of silk for the color and the weighting of it. The first arises from the nature of silk, the second from the nature of man, and the last is as likely to be as permanent as the first, because if ten cents worth of drugs, disguised as silk, can, without risk, be sold for a dollar, the weighting of silk is not likely to be discontinued before the millennium.

Hardness in cotton or woolen yarn is obtained by extra twist in silk by leaving the gum in it. If very hard silk be required, all the gum is left in it; then it is as hard and wiry as the hair in a horse's tail. If medium hard, half the gum is removed; if soft, all of it; then it is softer and flossier than the finest elder down.

Leaving out the weighting, silk is easier to dye than either wool or cotton, and the colors on it much superior. The dyeing and drying done, the silk is ready for spooling. There are several makes of warping mills for silk. I have seen silk warps made on an ordinary sectional woolen warping mill by substituting a silk creel to hold 400 spools for the woolen creel; the same leasing and gauge reeds were used. I have seen union silk goods woven on an ordinary broad woolen Crompton loom with a jacquard machine, but both were out of place.

The warping mill most in use has a large reel about nine feet in diameter. The ends pass from the creel over a glass rod at the top, to a lease reed, made on the same principle as the wool lease reed, through the gauge reed, then over a roller and under, not over the reel, as in a woolen warping mill. The same appliances are used for measuring as on a woolen mill, but the power is applied by friction wheels instead of pulleys. The reason the ends pass under the reel, is that the warp may come from the top when beaming, so that the warper may pick it as beamed. A dark piece of paper is put behind a light colored warp, and a light colored piece behind a dark colored warp as it leaves the reel, enabling the warper to see the knots and defective places in the yarn

and remove them. Should a warp be very dirty, it may take more picking than warping. Sometimes the picking is done in another frame and sometime, especially on tie goods, they are not picked. I have seen knots a foot long on silk warps. The warper removes the defects from about a yard, then beams it, then another yard, and so on to the end of the warp. At every twelve yards he inserts a piece of stout paper on the warp beam, thus dividing the warp into layers of about twelve yards each. The silk creel is handier and more compact than cotton or woolen creels. It is about five feet high, by six feet wide, and inclines a little toward a warp reel. The rows of spools are inclined a little from the perpendicular to allow clearance for threads from lower spools.

I have yet to see a pirn winding or quilling department, as it is called by silk operatives, even half decently managed. If every department of a factory be perfect and part of one be imperfect, it is a mismanaged factory, as the imperfection of one may derange several others. Among other things, a perfect quilling department requires quills to have, as nearly as possible, a uniform quantity of yarn on them, and that the greatest quantity possible; that the filling for each order be calculated, given to one winder and kept separate so that weavers cannot make more nor less than the order, and redyed yarn or old stock be impossible. Though the confusion incident to present conditions is very tiresome, neither superintendents nor filling department managers know anything better.

Silk men call drawing warps through heddles and reed, entering. Some factories do their own, others get heddles and reed already entered from places where they do nothing else. The enterer takes the leaves of the heddles, one by one, hang up, weigh lightly, then brush them out. The heddle knitter leaves a cord in the heddle eyes, and the enterer takes a wire with a hole through a spear like end, and longer than the width of the heddles, puts the cord through the eye and fastens it, then as the cord is drawn out the wire is drawn in and made fast. Having prepared a sufficient number for the draft required, he puts a cord round the ends of the set, more weight on, hangs the warp beam, prepares the warp and begins to draw in, passing the hook through the eye over the wire. Having drawn the warp through the heddles, he takes a lease with as many ends as are required for each dent of the reed, inserts rods, makes them fast, adjusts the reed, and reeds the warp with two bone hooks in the usual way. If there be two or more warp beams, which means two or more sets of heddles, the heddles not needed in each set are cut away.

In his "Silk Calculator," Ruegg intimates that practical men should know the kind of stock required for any class of goods they desire to make, but the number of bad warps found in most weave rooms and the number cut out as unweavable, show that such practical men are more imaginary than real. If a designer desires to get out something new or rearrange something old, he should have a good idea of the stock required, but if goods have to be made from sample, it should receive a careful examination to ascertain, not only the quality of silk in warp and filling, but the amount of weight and twist on it, and every lot of new stock should be tested on a sample loom before being put under way for the weave-room. This requires practical men.

So much has been written on weave-rooms, that thinking of it reminds me of teachers' conventions. Some one would deliver a harangue on how schools should be managed and how each subject should be taught. A visit to that teacher's school would generally show it to be an ordinary affair, so with weave rooms, though much has been written on them, they don't improve much. But there is a difference in weave-rooms and there is a best way to do everything, but like the narrow way which leads to

eternal life, "few there be that find it."

A first visit to a broad silk weave-room would be disappointing to a cotton mill man. He would see more dirt and disorder than in a gingham weave-room. He would see filling boards hanging every which way, some on nails in the walls, some on nails in pillars, others on S hooks made out of old lingos hooked in a string fastened to some part of the loom, or round a gas-pipe or pillar. He would see the old way of weighting yarn beams, weight on each end of a rope. He would see taffetas weaving with bow shuttles to clear the shed for filling and prevent holes in the cloth, and he would see special shuttles to hold two bobbins. When a bobbin is filled with cotton, it is an ordinary bobbin or pirn, but when it is filled with silk it suddenly becomes a quill. Why the poor little thing should be nicknamed a quill I don't know. He would also see silk weaving instead of cotton. With those exceptions he would see little difference between it and a cotton weave-room.

These remarks do not apply to ribbons. Some ribbon men seem to take a pride in their business. Their sole object does not seem to be to squeeze every cent out of it. I know one ribbon weave-room which is a model, as neat and trim as the parlor, Wednesday night, when the ribbon weaver expects her best fellow. The weavers in this room are women and girls. A better class of silk is put in ribbon warps than in broad silk, and the traverse of the shuttles is so short a poorer class of filling can be used without any trouble. Broad silk filling seldom runs more than ten, fifteen or twenty minutes, while ribbon filling will run from three to eight hours.

When a piece is woven, it is rolled on a roller by the weaver and taken to the picking-room; there the roller is put in a frame weighted same as yarn beams in a weave-room, end of piece fastened to another roller and kept tight while the selvages are trimmed and the cloth freed from all loose ends and dirt by the picker. It is then ready for the finishing room. There is little difference between cotton and silk finishing. The pieces are scoured, dried, singed, sized, calendered, and folded or rolled for sale. The watering process is done by passing moistened pieces through calenders with a pattern etched on one of the rollers, a sort of printing without pigments.

Silk calculations must be something formidable when they require a book. Silk is composed of the most irregular of threads. When a ten-pound bundle of cotton is bought, the buyer knows the exact number of yards in it and that all the skeins are alike. Not so with silk. When a bundle of silk is bought, the buyer takes two skeins at random from it, weighs and measures them, and takes the average of the two as the average of the bundle, but it is only an approximation. In cotton, weight is constant—length variable. A pound of No. 1s cotton measures 840 yards, of No. 2s, twice 840 yards. In silk, length is constant—weight variable. If 1000 yards be the standard length, and it weighs about 1 dram, it is called 1 dram silk; if it weighs 1¼ drams, it is called 1¼ dram silk; so that with these data a good arithmetician, well versed in textile calculations, should have no difficulty with silk.

—In 1720 the London mobs, principally from Spitalfields, so intimidated the Government of the day that a law was passed prohibiting the wearing of all printed calicoes whatever, either of foreign or domestic origin. This for a time strangled the rising industry. In 1736 this law was repealed, but the duty of 6d. per yard remained.

—A great feature of Chinese designing is their adherence to ancient ideals, and a great reluctance to change or to be influenced by modern styles or forms.

—Scotland did not take up calico printing until 1738, twenty-six years later than its commencement in Lancashire.

Indigo.

(Continued from page 54.)

The eminent chemists, Professors Henry Morton and Charles F. Chandler, long distinguished for their scientific and practical knowledge respecting dye-stuffs and coloring matters generally, testified to the effect: That the dye-stuff known as "indigo" was formerly obtained altogether from different varieties of plants, but within later years had been derived also from coal tar products; that they had subjected samples of the importation in controversy to the tests usually applied by chemists and experts in dye-stuffs to indigo and found that they exhibited the characteristics and displayed the properties of indigo in every respect, leaving no doubt whatever in their minds that the article was indigo and adapted to all the uses to which indigo was applied in the arts of dyeing and printing fabrics; that it was a very pure, or clean, indigo, being nearly free from foreign substances, the ash constituting only about 1.25 per cent. of the dry substance (exclusive of water), whereas samples of raw vegetable indigo had been found to contain from less than 3 per cent. to over 72 per cent. of ash, some also containing no more than 10 per cent. of real indigo, the remaining 90 per cent. consisting of impurities and adulterants, including clay, chalk, etc., which were either incidental to its manufacture or were purposely added to increase the yield, while the synthetic article would naturally be quite free from foreign matter on account of its source and method of production; that the article in question was neither the "indigo paste" nor "extract of indigo," of commerce, but was indigo suspended in water; that the essential coloring matter of indigo was indigotin, which as found in this article was absolutely identical with that in vegetable indigo; that the substances called indigo-brown and indigo-gluten generally found in raw vegetable indigo were impurities. They further testified that in their opinion it was impossible for a chemist to determine with certainty or confidence whether a given sample was of vegetable or synthetic origin; if it contained considerable earthy matter the conclusion would probably be that it was of vegetable origin, and if quite free therefrom, that it was the synthetic article, but it would be a matter largely of conjecture. Their testimony in this regard is strikingly confirmed by the fact that Dr. Wagner's report of analysis of a sample of an importation by the protestants of vegetable indigo in paste form or suspended in water, was similar in terms to that made by him respecting the importation in controversy, and which was assessed for duty in the same way, and is now the subject of protest before the Board.

Sixteen apparently disinterested and experienced practical dyers and manufacturers of textile fabrics from different places in New York, New Jersey and the New England states, who appeared on behalf of the protestants testified, in substance: That they had used the article in controversy, in greater or less quantities during the different periods since 1895, in the same vats, in precisely the same manner and with the same results as vegetable indigo (which all but one said they were also using at the same time). In other words, that they had applied it in the same manner upon the same materials and it produced the same color in the same way and bore the same tests as vegetable indigo, the cloth in many instances having been delivered to the Government under contract for indigo dyed goods. Most of these witnesses testified that they only knew the article by the name of "indigo J," but some said they had also heard it called synthetic indigo and artificial indigo. One of them testified that all the vegetable indigo his mill had used was bought in powdered form.

Although vegetable indigo usually occurs in commerce in the form of cubic cakes or irregular lumps, it is sometimes sold in powder, also (par-

ticularly in China), in paste form. Professor Roscoe says: "Indigo is a blue powder, insoluble in water, alkalies, alcohol and most common liquids. In order to employ it as a dyeing agent it must be obtained in a form which it can be fixed or firmly held on to the fibres of the cloth. This is always effected by virtue of a property possessed by indigo-blue of commerce with hydrogen to form a colorless body, soluble in alkalies, known as indigo-white, or reduced indigo."

All of the witnesses who testified in the case, called the article in question "indigo," of one kind or other. The term "indigo" as used in paragraph 580 of the present tariff act being without limitation or qualification, comprehends all kinds of indigo, irrespective of the source from which derived. As hereinbefore shown, indigo is produced from plants of very different genera and species, grown in widely separated parts of the globe, and also from coal tar products. The evidence is also overwhelmingly to the effect that in practical use the article in question exhibits the essential characteristics and displays the peculiar qualities which distinguish the dye-stuff long known to commerce as indigo. In other words it is (like vegetable indigo), a substantive dye requiring no mordant, being insoluble in all the ordinary solvents; is applied to textile fibres in the form of indigo-white or "reduced indigo," soluble in alkalies, and produces the same results, the color being identical and one of the fastest known in the arts. In chemical sense, as in practical application, its peculiar coloring principle, indigotin, is identical with that obtained from plants.

It is assumed that in providing for "indigo" the Congress had in mind the particular constituent or constituents which give the article its value as a dye-stuff in practical use. The theory of the Government's contention is, however, that the article is not entitled to exemption from duty unless it shall contain, in addition to these constituents, certain impurities and perhaps adulterants, usually found in commercial vegetable indigo. In other words that the tariff act does not exempt pure or clean indigo. If this contention should be sustained what would be the standard of purity, or rather of impurity of the indigo? Would it not exclude vegetable indigo when found to contain no more than about 3 per cent. of impurities (like the article in question as shown by the analyses), and would it include it when containing as much as 80 or even 90 per cent. of impurities or adulterants? It seems inconceivable that the Congress would present such an inducement for imposition in trade or carelessness in manufacture.

The Treasury Department held in synopsis 2143, dated May 12, 1875, that the term "alizarine" in the free list of the tariff act of February 8, 1875, was applicable to the article so commercially known whether derived from the madder root or from coal tar. This view was reaffirmed by the Department in a carefully considered decision (S. 4424) dated February 19, 1880 (three years before the passage of the tariff act of March 3, 1883), wherein it was said: "There seems to be no doubt that, at the time of the passage of the Act of 1875, the article under consideration was known commercially as artificial alizarine, to distinguish it from madder alizarine, and the term artificial alizarine is understood to mean alizarine produced by an artificial process." According to this ruling, the term "indigo" certainly includes "artificial," or synthetic indigo.

During the progress of a suit or suits involving the validity of certain patents, evidence was presented going to show that synthetic alizarine differed from madder alizarine as being freer from impurities, and consequently producing better results in practical use.

It was therefore contended (as in the case of the synthetic indigo in question) that it was not entitled in free admission, as the term "alizarine" in the tariff act meant "natural" and not "artificial" alizarine.

Therefore, at the instance of those interested in its importation and use in the United States, the Congress in the tariff act of March 3, 1883, changed the free list provision for the article to "alizarine, natural or artificial." In doing so, regard was doubtless had to the meaning of the words "'natural" and "artificial," as then loosely used and not to their true and proper signification. In strict sense there are no such things as "natural alizarine," nor as "natural indigo." Whether produced from plants or from coal tar products they are not substances as they exist or are found in nature, but are manufactured articles; in other words, are produced or composed by art rather than by nature, and are therefore artificial.

By the use therefore of the words "and artificial indigo" in the same tariff act (March 3, 1883), the Congress doubtless had reference to synthetic indigo. It does not follow, however, that it was intended by the omission of these words in the Act of 1890 to exclude that article. On the contrary, there are abundant reasons for believing that the purpose of the Congress was entirely different. In appears from a decision of the Treasury Department, dated June 23, 1887, that an attempt was made to have even the well known pigment "Prussian blue" admitted free of duty as "artificial indigo." It also appears from a printed document issued by the Senate Finance Committee in the year 1888, which embodied a substitute for the so-called "Mills Bill," (and which formed the basis of the tariff act of October 1, 1890), that the words "and artificial indigo" were omitted in the provision for indigo because their meaning, in the Act of 1883, had been misunderstood and advantage taken of them to introduce Prussian blue and aniline and other colors free of duty, under the claim that they were "artificial indigo." Furthermore, there had not then been any importations of consequence of indigo other than vegetable indigo. (Whereas so-called artificial alizarine had then practically displaced the "natural" article.)

It is a reasonable inference, therefore, that the omission of the words "and artificial indigo" in paragraph 614 of the tariff act of October 1, 1890, was not intended to exclude therefrom synthetic indigo, or artificial indigo, nor indeed indigo of any kind whatever, but was to guard against the exemption from duty of substances wholly different from indigo, which had been and were liable to be thus admitted under a misunderstanding of the true intent and meaning of the word "artificial."

It is assumed, indeed is well understood, that like precautionary considerations influenced the Fifty-fourth Congress in rejecting the words "whether natural or artificially prepared" in the "Dingley Bill." As hereinbefore shown, synthetic indigo had then become well established in commerce, having within three years prior thereto been largely imported and used in the United States under the name of indigo or indigo J; was found to be indigo by the chief experts and classifying officers at this port, and as such was admitted free of duty. As neither synthetic nor vegetable indigo, nor the like of them, were produced in this country, there was no domestic industry to be protected by imposing a duty on either. On the contrary the consumers of indigo in the United States were deeply interested in the exemption of the synthetic article from duty and in thus encouraging its production and importation in the promise of thereby securing benefits similar to those resulting from the successful production of synthetic alizarine, as hereinbefore shown, and of which the Congress was no doubt fully advised.

The adherence of the Congress to the provision for "alizarine, natural or artificial," in the Acts of 1890, 1894, and 1897, is doubtless attributable to its proverbial reluctance to changes in the mere phraseology of tariff provisions which have had executive and

judicial interpretation, as well as the sanction of legislative re-enactment, as was the case with respect to alizarine, but not as to synthetic indigo.

We find as a matter of fact:

"That the article in question is indigo and was so known in the commerce, and used in the arts, of the United States on July 24, 1897, and prior thereto.

"The protest is accordingly sustained."

Fall River Loom Fixers' Association.

The first term of the Fall River Loom Fixers' Association has just come to a close, and to give some idea of the work that has been in progress, we present the following list of questions which were used for the examination of students who have been taking a course of ten lessons. The next year's term will be much longer, no doubt, comprising in the neighborhood of twenty lessons, although this is a matter that has not yet been definitely settled. More than thirty pupils have completed the term in the designing class, and about an equal number in the loom fixers' class. The examinations upon the questions given below were thought to be very satisfactory, everything considered.

Questions for Examination:

1. Make a six harness twill with the twill lines running from left to right.

2. Make a six harness twill with the twill lines running from right to left.

3. Make a five harness satin filling face.

4. Make an eight harness satin warp face.

5. Design a striped pattern based on a four harness twill $\frac{1}{3}$ about 16 threads warp face and 16 threads filling face, also give draft for same.

6. Make a checkerboard design from some twill, one square warp face and the other square filling face arranged in plain cloth order.

7. Design a checkerboard pattern based on some satin, one square warp face and the other square filling face arranged in plain cloth order.

8. Design a honeycomb and give draft and chain.

9. Give two examples of steep twills.

10. Give two samples of reclining twills.

11. Make a basket weave and give draft and chain.

12. Show how you would get the order of intersections with the counter for making a perfect satin.

13. Make a twill from the following: $\frac{3}{1}\ \frac{1}{3}$.

14. From the following twill make a diamond pattern $\frac{3}{3}\ \frac{2}{1}$, the last thread in twill to be the centre thread.

15. Make a design based on a $\frac{1}{3}$ twill with the $\frac{2}{3}$ twill for motive.

16. Make a design based on a $\frac{1}{3}$ twill with $\frac{1}{3}$ twill for motive.

17. In building a chain for a weave which is required to have the twill lines running a certain direction, how would you build it for a left hand head and how would you distinguish a left hand head from a right hand?

18. Analyze cloth given and give draft and chain.

Drawing In Warp Threads.

There is a recent French invention of a machine for drawing in warp threads through the reed by a mechanical means, automatically regulated continuously. The operating of the hook, the drawing back of the same, and the following advance of one tooth, are effected absolutely mechanically, and without possibility of failure, according to the claims of the inventor.

—In making an estimate of the probable quantity of cotton goods likely to be absorbed by regenerated Cuba, the safest course of procedure will be to rest such an estimate on the present economical conditions.

—In 1689 Jacques Delure commenced printing at Neuchatel, and the art then soon spread into Germany, Portugal and France.

WOOLEN DEPARTMENT.

The Science and Practice of the Construction of Woven Textures.

FRED BRADBURY.

(Continued from March.)

In the single and plain weave structure just previously considered, we have not only shown how, by a modification in the setting, an additional effect of color and design may be obtained, but have laid down a fundamental principle which may be a guiding factor in the construction and production of woven fabrics, of either single, double or compound weave, in each of which various sizes of yarns are employed. In applying this principle to a fabric of similar weave, but double in structure, I propose to consider the following make of cloth. This fabric may be classed as a medium weight tapestry hanging, or as being suitable for various upholstery purposes. The cloth is made in three surface colorings. The particulars of make and the chief points in its structural composition are as follows:—

Warp:
1 thread 2/36s cotton—reddish brown.
1 thread 2/36s cotton—cream.
Diameter=the square root of 18×840—8⅝=$\frac{1}{11\frac{3}{8}}$ of an inch.
Set in loom 22½ reeds 8s.
Finish 192 threads per inch.

Weft:
1 pick 1375 (yards per oz.) tram silk—yellow.
Diameter=the square root of 1375×16—8⅝=$\frac{1}{11\frac{3}{8}}$ of an inch.
1 pick 2/36s cotton—yellow.
Total picks per inch in loom=74.
Picks per inch finished=88.

Weave:—Double plain in ground or body of texture and silk weft flush in figure.

Weight:—14 ozs. per yard finished for 52 inches wide.

A true conception of the structure and chief features of the cloth under discussion will be better and more fully appreciated and understood by reference to the photograph of the actual cloth shown at Fig. 40. Observe, the ground or body of the face cloth is perfectly plain, but in two surface colors. First, the yellow silk weft interweaves with the reddish brown warp and forms the chief ground effect; second, the yellow cotton weft interweaves with the cream warp to form the secondary effect of color in the surface ground texture. The silk weft is flushed to produce a figure upon the surface of the fabric. The longest flushes of the silk weft are tied down by the cream cotton warp, while the cotton weft and the reddish brown warp produce a perfectly plain texture upon the underside of the fabric. When the cream warp and cotton weft are producing upon the surface a perfectly plain weave, the reddish brown warp and silk weft interlace loosely upon the underside of the fabric.

A cross section through the warp which shows how the respective sets of threads interlace to produce the above results is given at Fig. 41. A point paper or working design is given at Fig. 42. The portion given represents only a section of one repeat of the figure design, but sufficient is worked out to fully demonstrate all that is necessary for instructive purposes. In the section of figure design given, the odd threads represent the cream cotton warp, whilst the reddish brown warp is represented by the even threads.

In the following instructions for cutting, a hole cut in the jacquard card is to be understood as warp raised.

First, cut on all odd picks, white in ground, black in figure, and marks thus ×, in shade portion of ground, insert cotton weft.

Second, cut on all even picks, marks thus ×, in white ground, white on figure, and all but marks thus × in the shaded portion of the ground, insert silk weft.

To a casual observer, the development of the ground design may appear to be a straight twill, but if read

with card cutting instructions given above, it will be seen that it produces a double weave in the cloth. This method of indicating the development, results in a very considerable saving of time, and not infrequently of the chief designer's time. It will also be found advantageous to cut the cards

Fig. 40.

for all the odd and even picks separately.

The chief feature in the construction of the cloth is, as will be subsequently shown, that the ends of each fabric, i. e., face and back, are very much closer together than are the picks of weft, consequently the warp produces most of the bending while the weft in the woven piece lies almost straight, and lastly the surface of the ground texture shows an almost solid color of the warp shade only.

Suggestion:—Similar effects of color and weave as given above might easily be obtained by using the same warping particulars and only one kind of weft, but cost will be increased if silk weft is used. However, to set against this there would be required in some cases only one shuttle, thus giving the manufacturer the opportunity of using a plain loom instead of a box. There would also be the consideration of an increased improvement of both handle and lustre. These factors then, together with the requirements of his customers, must, therefore, influence the manufacturer in his decision when he is producing new sets of patterns.

Upon referring again to the photograph given at Fig. 40, the reader will observe that there are three distinct effects of light and shade, which in the actual cloth are: First, reddish brown; second, cream; third, yellow; being the two cotton warps and silk weft respectively. The cotton weft does not appear as a factor in the surface coloring, being almost entirely covered, due to the increased angle formed by the cream warp threads with which the cotton weft interlaces to produce the cream colored surface. It will presently be observed that this increased angle of curvature of the warp threads is produced by setting the threads in such a number as is almost equal to the denominator of their individual diameters, for example:

The actual double fabric under consideration contains 192 threads per inch, and 88 picks, or 96 and 44 threads of warp and weft respectively, for each single texture (face and back). The number of warp threads per inch is 113 or only 17 more than the actual double cloth contains, which clearly shows that the cloth is set almost up to its diameter and very much more than would be necessary to produce a woven fabric in which the angles of warp and weft are equal, i. e., constructed upon the principle as explained in Fig. 8 and embodied in formulae II and IX, but in which case the solid color of warp on the surface could not have been obtained.

FIG. 41.

Top line, silk weft. Bottom line, cotton weft. Round dots, reddish-brown warp. Crosses, cream warp.

Then by formula II or IX (warp $1/113$ + weft $1/145$) $= (145 + 113) \div (113 \times 145) = 258/16{,}385 = 1/64''$ or 64 threads of warp per inch, and since the intersections are equal to the number

of ends in each repeat of the pattern, the number of threads of weft would also be 64 per inch, which reveals that the actual cloth contains (96 — 64) = 32 threads per inch more of warp, but (64 — 44) = 20 threads of weft less per inch than would be required if made according to the above conditions (Fig. 8), thus it is due solely to these facts that the warp performs all the bending while the weft is almost straight, even though the natural

is to the number of threads in the assumed, so is the numerical value of the angle of the assumed cloth to the numerical value of the angle of the threads in the actual cloth thus: Let X = the numerical value of the cosine of angle of curvature of warp or weft in the actual cloth. Then 96 : 64 : : 0.866 : X = 0.866 × 642 ÷ 96 = 1.732 ÷ 3 = 0.577. When cosine of angle X is 0.577 the size of the angle is always 54½°.

FIG. 42.

tendency of the threads is diametrically opposed to these conditions. The respective sizes of the angles produced by these two sets may be readily determined by the application of Formula X. If we assume the 64 threads per inch be taken to represent the number of threads per inch in our theoretical starting cloth, then as the number of threads in the actual cloth

In a similar way we should obtain the size of the angle of curvature produced by the weft thus: As 44 : 64 : : 0.86 : X ∴ X = 0.86 × 64 ÷ 44 = 13.856 ÷ 11 = 1.260.

But observe that the cosine of a right angle cannot be greater than unity, for the base of the triangle produced would be greater than the hypothenuse, which is impossible. Note:

That as the value of the cosine of an angle approaches unity, the size of the angle vanishes, and the hypothenuse becomes a horizontal straight line, i. e., parallel to the base, hence the weft will then produce an almost perfectly straight line, except in such places where it passes from the face to back cloths or vice versa. This straightness of the weft may be retained even though the number of picks are somewhat less in the actual cloth than may be inserted into a fabric of ideal structure.

These are the conditions that enter into the construction of the above woven fabric, viz.: The number of threads of weft are slightly less than could have been easily inserted with the same particulars and set of warp threads, but the difference is so slight as not to materially interfere with the structure cloth and effect required.

Felting.

After the stock has been shaped into bats in the card room, it stands to reason that it will not stand much handling in that condition, and that some kind of a process has to be employed to get this web into such a condition that it can be handled well in the after process. To accomplish this end, what is termed the "hardening" process is employed, and after the web has gone through this operation it is changed from a web or bat to what looks, and is, for all practical purposes, a piece of cloth, and it is so termed after this process. For the hardening of the web a very simple but effective machine is employed called the hardener, which, however, takes up considerable room. The mechanical part takes up very little space, but the attendant fixtures require quite a space. In order to best understand the mechanical part of the machine from description, imagine a chinchilla machine with a bed and follower, 36 inches wide and as long as the maximum width of the goods to be treated, which runs up to 100 inches and over, and you have a fair idea of what a hardener looks like. The bed consists of a corrugated cast iron plate and the follower is a similar plate, which have wooden frames around the edges, to enable a canvas covering to be secured over them. The corrugations on the plates are not very deep, and their chief purpose is to keep the canvas from slipping and wrinkling up. On one side of the machine where the power is applied, crank arms connect the follower and bed with a shaft, to which, by means of belts and gears, a reciprocating motion is imparted to the bed and follower, causing them to vibrate back and forth. The vibrations may be regulated in length according to the demand of the goods under treatment, but as a general thing they do not exceed a quarter of an inch from one extreme to the other. On account of this vibration, it is necessary to have a very solid foundation for this machine, or else everything will be shaken to pieces. Usually a foundation of stones and cement to the depth of from four to six feet is made, and the bolts which fasten the machine, generally very heavy ones, are firmly imbedded in this foundation. Unless the foundation is very good, frequent repairs will be necessary, and the life of the machine is considerably shortened, to say nothing of the time lost in making repairs and the unsatisfactory condition of such a machine in general. Therefore, it will be well to look carefully after the foundation. The machines themselves vary in construction, for we find them where both bed and follower are made to vibrate, while others simply have the follower vibrate and the bed stationary. The follower is fixed so it can be let down on the bed or raised up, as the case requires, by means of levers, and here, too, is a difference in the construction of some machines, for while on some the raising and lowering of the follower is performed by power, on others it has to be done by hand. The duration of the vibrating process, as well as the length of the stroke, dif-

fers on various goods, for the heavier the goods are which are to be hardened, the longer the vibrations must last, and the longer a stroke is necessary. The length of time for the vibrations can be controlled by means of a shaft having a worm on one end and different sized pulleys on the other. The worm on one end operates a gear, which with every revolution will knock off the shipper handle, thus throwing the belt on the loose pulley, and bringing the vibrations to a stop. After stopping, the follower is raised, thus admitting the goods to be drawn along. A bench-like construction, as wide as the mechanical part of the machine, is found on each side of it. On one side the bench is about eight yards long, while on the other side it is about half as long. A steam box having rows of perforated pipe and well covered with burlap, is placed on one side of the mechanical part of the machine, between the eight-yard bench and the machine proper. This box is of the same width as the bed, 36 inches. The benches are constructed in a very substantial manner, the top being made of solid planks eight inches wide, and placed about eight inches apart. In the centre, between these planks, are placed rolls which are from six to eight inches in diameter, so that the top of the roll will project about three inches above the surface of the planks, the object of which will presently appear. On the extreme end of each of the benches we find a shaft placed about the height of the planks, to which a crank and handle can be attached to turn them. On these shafts a canvas apron is operated about 50 yards in length, which is run the whole length of both benches, and passes over the steam box and bed of machine. This apron is first rolled up on the back end, which is the longer of the two benches, and is then stretched over the benches, steam box and bed, and just catched on the shaft at the point or short end, so that it can be rolled up there when wanted. The apron is then well moistened with water, and the carded stock placed upon it, with the end next to the bed and just covering the steam box, and is then unrolled towards the back end. Upon the stock is placed a burlap apron, which has also first been rolled upon a bat-stick, and covering the end of the stock at the steam box is also unrolled towards the back end, thus completely covering the stock. This burlap apron is also moistened with water, which is generally done by the use of sprinkling-cans.

After this has been done, the steam is turned on the box to saturate the stock, and here is where the experience is necessary, for if the steam is turned on too much, the stock gets too wet and will then not harden as it should, leaving the cloth spongy and hard to handle afterward. Also, when not enough steam is used, the hardening process will not be successful, for the stock will come out of it in very little better condition than before. To regulate the steam, therefore, so that enough will penetrate the stock while part of it is under vibration, is quite a difficult proceeding, and can only be acquired by long and careful experience. After the stock has been properly steamed, it is drawn on the bed, aprons and all, by means of the shaft and crank at the end of the short bench. It can now be seen why the rolls are placed between the planks, for if it were not for these rolls it would be next to impossible to drag the heavy aprons and stock saturated with water and steam, and even with them it is none too easy a job. When the steamed part is on the bed, the follower is let down, and the machine set in motion. During the time that the first width is hardened, the second receives its steaming, and here is where the judgment comes in, to regulate the steam so that it will be just enough when the vibration stops and the goods pulled ahead, and not too much or too little. As soon as the vibrations stop, the follower is raised and the goods pulled

along for another width, and so the process goes on until the whole has been hardened.

As soon as enough has been hardened to allow of its being examined, a careful study is made to see if the goods are in the condition they should be, and the steam, duration of vibration, or length of stroke is regulated to bring about this end. The aprons, as well as the goods, are again rolled up on sticks, each separately, so that when done the goods can be taken to the fulling mill, and the aprons are ready for use for the next set of goods.

In order to hasten the work, from two to six pieces are often put on top of each other, of course with an apron between each; and on goods which weigh not more than 10 or 12 ounces to the yard, it is customary to run six pieces at a time. When the stock is of a low grade, one hardening will not be sufficient to bring them to the condition where they can be handled safely, and it is therefore necessary to have them go through the process twice. Now it might seem as if it were just as good to simply lengthen the duration of vibration, but much better results are obtained if the goods are allowed to be on the sticks a while before they go through the second hardening, and, for this reason, only three pieces are taken the first time, and the next time three new bats are placed on top the three half-finished pieces with an apron between each. After that there will always be three finished and three half-finished pieces for the second hardening. How many pieces can thus be done depends entirely upon the thickness of the goods, and on light weight goods six pieces may work all right. On heavier goods, of course, less can be done at a time, and on heavy felt for harness pads and for the laundry trade, which weigh from 8 to 12 pounds to the yard, not more than one piece can be successfully hardened, and on such goods the duration of vibration has to be extended to its utmost limits, and often has to be repeated three and four times before the goods are sufficiently hardened. As soon as the goods are hardened, they are taken to the fulling mill, and are here unrolled and soaped and fulled until they have the required consistency. They are then washed and are ready for the dye house. If they need coloring they are dyed, and if not, they receive a starch bath, which will make them feel better. Most of the light weight felts of the cheaper grades receive more or less starch, no matter what the color may be. They are then thoroughly extracted and dried. After drying, they are ready for the final operations of pressing, doubling, measuring, etc. On finer goods, gigging, brushing and shearing are often necessary, but on the lower grades this is not necessary.

REAUMUR.

Wool and Action of Acids and Alkalies.

Every overseer who has to handle the wool fibres in any form during the processes of manufacture, ought to have a competent knowledge of the qualities of the wool fibre and of the way in which those qualities act and are acted upon under the influence of various kinds of agencies or methods of treatment. There are so many different processes and materials that enter into the various operations of manufacture that it is absolutely impossible for the wool fibre to pass through these various processes and operations without being more or less altered, changed and affected. Some of the materials or agents produce favorable and indeed beneficial results when they are employed under certain conditions, while under slightly varied conditions they act in an opposite way. Some materials that used alone would destroy the fibre, when used in conjunction with some other agent might have no effect whatever except such as would be for the advantage of the finished product.

In the dyeing, scouring and finish-

ing of woolens, in fact, in all the wet processes of wool handling, from the fleece to the finished product, acids and alkalies play a very important part. And acids and alkalies are amongst the substances whose action is not always thoroughly understood, and whose effects may be good, bad or indifferent, according as the one who uses them is aware of the results which are apt to follow where they come into combination in the wool fibre or fabric.

Perhaps the most common acids which enter into wool manufacturing processes are sulphuric and hydrochloric. They act somewhat similarly under most circumstances and may be treated together. When these acids are used in concentration they have a very decided effect upon the wool fibre. Their effect is to cause the fibre to swell out, the leaves or laminae which make up the little microscopic scales on the outer coating of the fibre are pushed up and out so that the whole formation and structure of the fibre is altered. If the concentration is sufficient, and if the action is prolonged, the complete disintegration will ensue, and the fibre will be destroyed, a hopeless mass of pulp material of no use or value will result; and complete burning and destruction will result if conditions are right.

The action of these acids on the cotton fibre and on vegetable fibres generally is much more energetic than on the wool. The same acid that would scarcely have any appreciable effect upon a wool fibre would reduce a cotton fibre to a hopeless mass of dust, which when dried may be blown or beaten from the cloth. This effect is in fact employed in the removal of cotton and waste products and fibres from woolen goods. The wool or woolen cloth is treated to a solution of sulphuric acid. Then the material is dried in a drying apartment at a temperature of about 110° C., and after this is completed the dust is beaten out of the material and nothing but the clean wool fibre and fabric remains. The very same result will follow where the material is treated for a few hours to a heated atmosphere of hydrochloric acid gas.

It is well to bear in mind that if these acids are used in dilute solutions, they have very little effect on the wool fibre. The effect, if there is any, is not worthy of mention. They do not destroy the fibre, and cause nothing further than perhaps a slight swelling of the fibre which makes an imperceptible roughness, more evident, of course, as the dilution decreases. It is also a fact that within reasonable limits it makes no difference whether the dilute acids are used hot or cold, their lack of evil effects is just the same.

Another acid which is used in the manipulation of wool is nitric acid, which has more of an effect on the wool than either one of the others already mentioned. Its action in the respects mentioned in regard to hydrochloric and sulphuric is just the same, but it has the additional effect of leaving a color on the wool fibre, which the two previously mentioned have not. This color is a light yellow or yellowish tinge. If wool is boiled, even colored wool, in a bath of dilute nitric acid, the color of the wool is removed and the color imparted by the nitric acid takes its place. It is a common practice, therefore, to use nitric acid in cases where wools are to be re-colored. The dye already in the material is stripped by means of the nitric acid bath and then the new colors may be applied. The acid must be used of moderate strength and the exposure must not exceed three or four minutes. If mistakes are made in either of these particulars, there is apt to be trouble, just as in the case of the acids previously mentioned.

Another acid gas which has a very marked effect on wool fibres is sulphurous acid gas. This agent has a bleaching effect. It acts on the yellow natural coloring matter of the wool and removes it, so that the fibre appears pure white. If it is neces-

sary to bleach wool first, and then apply a color afterwards (colors that are light and delicate are thus handled), it is necessary to remove the acid gas from the wool fibres before the coloring matter is applied. If the sulphurous acid gas is not taken thoroughly out of the fibre before the new color is applied, it will in the course of time begin to act on the color, and the color will surely be changed or destroyed. The acid gas is a very strong and active agent and can decolorize almost any dye that is brought into contact with it. So take away the acid gas, saturate the wool in a bath of dilute carbonate of soda or of bleaching powder, and then wash well, and all traces will be gone.

There is another considerable class of agents that act on wool fibres and affect in different ways the ease or difficulty with which the fibres pass through the several processes of finishing. Alkaline products occur in various forms and enter into the wet finishing and coloring of wool. And it is quite as essential to success that these be understood as others of different natures. As with acids, effects are likely to differ according as the alkali differs in its nature, and according as it is used. Concentrations and dilutions will produce dissimilar results, and temperature and the length of time fibres are exposed have much to do with the kind of effects produced.

The agents known as caustic alkalies always act injuriously upon wool fibres. Where used freely, even though weak and cold, it makes no difference, they will produce effects which are undesirable. As agents to be employed in scouring, therefore, they are to be condemned. If the alkali is used at a high temperature, the wool is absolutely destroyed and dissolves away into a sort of a thick soap-like liquid. If alkaline carbonates and soap are employed in solution, and are used at reasonable concentrations and temperatures they will not affect the wool to any appreciable extent. Soap and ammonia carbonate is a very common alkali used in this way, and always with good results. Potash and soda carbonates are all right too, but they may leave a slight yellow shade on the wool and also may affect its feel or handle. The action of soda is almost invariably of this sort.

It is absolutely needful that the operator appreciate the difference between these two classes of alkalies. In one case he is practically unable to use the agent in scouring, in the other he can, if it is used with judgment and care. It is always well to have a clear idea just what the nature and ingredients of our agents are. If there is any mistake it will be sure to lead to endless difficulty. All soaps ought to be free from an excess of alkali, if we expect them to do good work, and carbonate of soda or "soda ash" must not contain any caustic alkali.

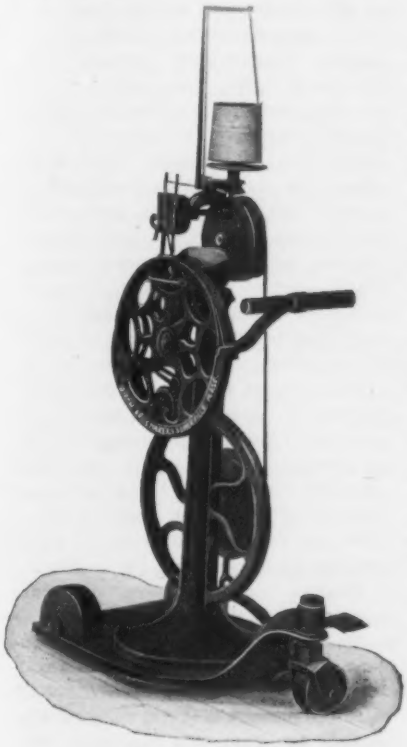
Another substance that acts like the caustic alkalies is lime or calcium hydrate. It has not the same powerful effects as the caustics, but it is injurious and always acts in such a way as to alter the success which fulling and kindred operations can be performed.

MANUFACTURER.

Patent Rotary Sewing Machine.

The accompanying illustration shows William Birch's patent rotary sewing machine on the American or new style stand. Birch Bros., Somerville, Mass., are the builders. Many of these machines are now in use in the largest woolen and worsted mills in this country. The new style stand makes it still further desirable. It is especially arranged for sewing in front of printing, napping, crabbing, finishing, pressing, dyeing, washing, fulling, singeing, tentering, drying, dewing and other machines. The treadle is placed in front of the machine, so that after setting the machine in position to sew, the operative can go ahead and sew without having to walk around to the treadle. This is

a convenience which will appeal to practical men. This style of machine is unusual for heavy and strong construction. It is designed to sew any thickness of any fabric, wet or dry, free from puckering. A running stitch is sewn which can easily be withdrawn from the cloth. Any length of stitch can be used, from the smallest to ⅜" long, and change in the length can be effected in an instant. The feed is intermittent, the cloth be-



ing at rest while the needle is in and the loop is being made. It makes a real flat chain stitch, and the thread does not cross itself. There is no revolving looper used, no winding up of the thread around the looper and no picking off. The machine can be run all the time and will chain from one piece to another without any difficulty. Being constructed to special jigs, the parts fit right, and are interchangeable, thus being easily repaired, but the machine is so simple and easy to work that it seldom gets out of order. It is put out on 30 days' trial to responsible parties.

Birch Bros. carry these in stock ready for immediate delivery. They also make tacking or listing machines to run by foot or power, together with a full line of machinery for woolen and worsted dyers and finishers, and calico printers.

The Tientsin Woolen Mill.

The entire contract for the plant, supplied by American machine shops, of the woolen mill that has been organized at Tientsin, China, including the textile machinery, boilers, engines, electrical equipment, shafting, belting, etc., was completed in less than three months, and was shipped on February 8, 1899, in the steamer Thornhill, of the Perry Line, from New York, via Suez Canal, and comprised a total of 375 separate boxes, or cases, aggregating 325 cubic tons. Allowing 40 cubic feet to a ton, 13,000 cubic feet was thus occupied by the shipment. Competent men, to set up and run this machinery, will be sent in due season, going to China via the Pacific. Some idea of the details connected with such a contract may be understood when it is stated that the boxes, or cases, were numbered consecutively, and each case marked with the name of the consignor and consignee, and net and gross weight in kilos, and the cubical dimensions in metres, together with a total manifest of the contents of each case.

—It is strange that mercerization should have passed in England without attracting much attention, and that it should have been rediscovered by Thomas and Prevost, of Crefeld, whose first patent is only dated, March, 1895.

—Mercer did not go far enough in his invention, and he did not know the lustring effect produced by the stretching operation by the treatment with caustic soda.

KNITTING DEPARTMENT.

The Knit Goods Situation.

The proposed knit goods trust is not making much headway, even in this period of combines, and indications are not favorable for its consummation along the lines thus far suggested. The committee appointed at the recent meeting of manufacturers has requested contributions of $25 each from concerns, to defray the expense of investigating and valuing the plants to be acquired.

One mighty important point should be noted in this connection. All those mentioned to date, as interested in promoting the combination, seem to be makers of flat goods, not jerseys. Possibly there are some jersey manufacturers in the background; if not, the fact is illuminating. Of course, there are many knit goods men unfeeling enough to say that the movement is promulgated mainly by owners of antiquated flat goods plants, who long to unload them. Surely there is in this an element of truth, but a middle ground would come nearer facts.

Nobody doubts that a combination within reasonable limits would prove beneficial to all concerned, but unless the present scheme is greatly modified, it is manifestly impracticable. It is so clearly unfeasible that many conservative manufacturers have refused to consider its details after hearing the main features of the plan outlined.

It is to be hoped, now that a fractional part of the trade has got its heads together, that at least several mutual agreements can be reached in the way of abolishing abuses. These abuses are in the form of concessions, made because each house stood for itself alone and was afraid if it did not grant what jobbers and retailers demanded, other sellers would. It would be a great achievement if a large combine refused to continue such large values in twenty-five cent goods, as now prevail. This, merely by way of illustration.

Hosiery business for April promises to reach a larger total than for seven or eight years and advices from German manufacturing centres are equally encouraging, although the backward spring has retarded even the movement of the best staples and cut off reorders. The rage is for lace goods, but the prudent minded are going slow thereon. They cannot help noting that the plainer patterns of lace goods are quiet, only decided fancies being in frequent request. Signs point to a repetition of the experiences on colored fancies where one style was hardly taken hold of before it was dropped for a newer.

Speaking of fancies, it may be remarked in passing, that stripes are now slow; polka dots having the call, particularly black spots on light grounds, the grounds being extracted, instead of the dots being printed. The split feet trade in women's goods is steadily increasing.

English manufacturers, are, unquestionably, still suffering.

Medium to cheap grades of seamless hosiery are better sustained, which is cheering news indeed. Full fashioned goods are still in good condition, so reassuring, in fact, that over-confidence is likely to be begotten.

Foreign hosiery, is, in many instances, being laid down here lower than under the old tariff. Perhaps this achievement is responsible for the efforts some American manufacturers are making on silk goods, which were never of as good workmanship and design, as at present.

To come to underwear, fleeces continue to be in extraordinary demand.

The protracted winter has swept retailers shelves nearly clear of heavy goods. This is shown by the reports of traveling salesmen and duplicate orders for heavy-weights already received, although the original order season has hardly closed. In several instances, the duplicate orders have been as large, or larger, than the original orders. This puts the trade in high feather, for fall business is worth at least twice as much as spring traffic.

But the joy is mitigated by the way in which cotton fleeced underwear of low grade has supplanted other goods. It will not take long for consumers to realize that they have "bought the rabbit" dearly, but in the meantime, the trade suffers none the less.

Worsted manufacturers have lately brought out fancy vests with embroidered patterns that are decidedly neat and novel. Their price is equally attractive. Women's worsted skirts, with vertical stripes and varied effects, are also being extensively shown. Worsted and cashmere sweaters in light weights, too, are multiplying and promise to virtually drive heavy weight goods of this description, out of the market, in the near future.

Knitting Machines in Latin America.

Some interesting facts relative to possible requirements for knitting machinery at points in Mexico and South America are furnished by correspondents to the effect that there are 19 firms in Buenos Ayres engaged in some branch of the textile industry. Many of them manufacture only knit goods. Baibiene y Antonini's factory has the latest improved machinery for making all kinds of hosiery. It is operated by a 40 H. P. engine and employs 350 people. Its daily capacity is 300 dozen of undershirts, 1000 dozen pairs ladies' stockings, and 350 dozen pairs men's stockings. E. Chocilion y Cia. turn out daily 50 dozen undershirts and 50 dozen stockings. Number of people employed, 100. E. Dell 'Acqua y Cia. manufacture linen goods, principally table cloths and napkins, and hosiery of all kinds. The plant has three 8 H. P. engines. Antonio Mir's factory is run by an 8 H. P. engine and produces about 1000 dozen undershirts per month. About 100 persons are employed. R. Monteros y Cia. are operating 65 Branson machines. They employ about 500 persons. The factory turns out daily 600 dozen pairs of stockings and 200 undershirts.

The extent to which the textile industries remain to be developed in Argentina is indicated by the still large importations of fabrics, the figures of which for 1897 are as follows: Silk goods, $1,945,000; cotton goods, $12,368,000; woolen, $5,957,000; linen and others, $5,916,000. While cotton goods are more largely used in Argentina than woolens, the production of the latter will increase more rapidly because cotton has to be imported. It is not to be expected that Argentina will much longer continue sending her fine wool to Europe to be returned to her in a manufactured form when by dint of a little energy and enterprise she can make her own woolen goods. Cotton was at one time grown in Argentina and a movement is on foot to renew the production.

Colombia offers very good openings for the introduction of hand knitting machines. These, it is said, would sell well, for the people are progressive and independent. They do not favor the creation of large plants, preferring to see the work distributed among many persons than limited to a few. It is the opinion of our correspondent that the introduction of suitable machines into Colombia would be attended with success. They would require to be exhibited and explained before a demand would arise, for the people cannot be expected to become interested in what they know nothing of.

The opinion of a correspondent at Lima, Peru, after talking the matter over with interested persons is that knitting machinery would be well received provided its mechanism was

not too complicated and the prices did not range beyond $10 and $15.

The principal hosiery mills in Mexico are in Guadalajara, City of Mexico, and Orizaba. Most of the machines in use are British, but there is a fair proportion of French, and some of the best machines in the country are of French manufacture. In the vicinity of Guadalajara there are three factories with over twenty knitting machines. The Taller Guadupano has 20 machines run by hand. "Las Fabricas de Francia" has 100 machines run by steam using Creelman Bros.' machines. This is a Canadian company. "La Progresista" has 100 machines now run by hand but with prospects of putting in steam. They use a machine made by Branson. These three are the biggest in the State, but in addition there are many others using from one to twenty machines.

Chihuahua has a clothing factory whose owners are thinking of adding a hosiery branch to it.

According to a Durango agent there are eight or ten spinning and weaving mills for cotton and wool in the State of Durango. Two weaving and spinning cotton mills are in the City of Durango. The machinery in use is of English and German origin. The quality of goods made consists of dark and white cotton goods; cashmeres; cloth, and other woolen articles. Every day sees an extension of industry all over the country attributed to the low price of silver, the principal article of export of Mexico. The motive power of the mills is steam and water falls.

Only cotton yarns are worked, and these in small quantities. The manufacturers of counterpanes and blankets buy No. 16, 2 and 3-ply yarns.

Reels and spools are mostly used by the manufacturers, who buy from agents established in Mexico or import them directly from England. Almost all machinery used in the textile industry is English. Machinery is imported packed in wooden boxes. The price of cotton yarns is $1.00 per kilogram plus 5 per cent. federal duty.

From Chemnitz, Saxony.

SITUATION UNSETTLED — PRICES — DEPARTMENTAL STORES, TRUSTS, ETC. —HOSIERY — GLOVES — UNDERWEAR.

The situation in Chemnitz and suburbs is anything but settled or secure. It is not in nature to withhold admiration from a people whose push, patience and recuperative powers are unprecedented in the history of trade. The inevitable is recognized, that you are going to make more and more of your own hose, half hose, underwear and gloves. No one is deceived. Weep some may, but they won't lie down under it. They are up and "humping it" into new territories. Russia is rapidly rising in favor. Her 125,000,000 men, women and children will want hose, half hose etc. This applies to China's and India's millions. True, they will not want as nice goods as the United States, for the people are too poor to pay high prices; but, and right here German shrewdness is in evidence, the United States will continue to take the better grades for quite a while longer, thus leaving Chemnitz free to sell its cheap grades to Russia, Australia, the East, South Africa, etc., etc. A still further reduction was recorded in the first quarter of 1899. Orders came in and are still coming; but they are by no means so big as in other years.

There is no knowing just what turn prices will take. That they will never go back to the big figures of other years is certain. United States buyers put the blame on the merchants and manufacturers here; while the latter blame the buyers. Big New York men have to turn over nearly twice as many goods, now, to make the money made formerly, say six or seven years ago. Hosiery prices are simply horrible. One is unable to understand how it is possible to pay for raw material, etc., and put goods on the market at 2, 3 and 4 marks a dozen pair. If anyone wants mental gymnastics let him take this problem.

With us, here, as with you, every-

thing is tending towards departmental stores, trusts, etc. Is not every move of this kind grist to the socialists' mill? Will anything be wanting by and by, to prove what the socialists claim, viz., that it is better for the state to organize every industry on a big, cheaper producing scale? "What fools we mortals be!" Here a howl, long and loud, will awaken the world, if departmental stores and trusts continue to crush out the middle men. It is amusing to watch the workings of the law against unfair competition. How far will paternalism be pushed; or is this policy of protecting the weak against the strong paternalism?

In hosiery, everybody is fairly well off. Prices, as pointed out above, are bad. Orders came in all month for a few fancies, nice goods, and for staples. Lace goods were favorites. A belief is gaining ground that these will not "wash and wear" any better than fancies. My own idea is that they will go over into staples and stay there, especially for summer wear. Printed goods have gone well; so too embroidered goods. These, however, are not nearly so nice as the lace line. One house here ordered ninety new petinet machines. Letters from the States encourage a belief in better times. The rise in wages with you, is a most encouraging sign. "If the farmer has gold, goods will be sold." If the help are well paid on mule and on loom, say I, business will boom.

In the glove line everybody is busy as can be. It is a great question whether orders can be filled on time. Help is scarce. Button gloves are still the craze. A strike is said to be expected. Intelligent manufacturers and merchants, seeing the uncertainties that attach to actions of this kind will undoubtedly anticipate any outbreak by advancing the amount asked for, five cents per doz. They are sure to get it back, because buyers must pay it; there is no alternative. Ringwoods are still the favorites. A nice novelty is out in silkette, a mercerized cotton. It looks so like silk that experts are deceived. English and United States buyers are vieing with each other in their efforts to get enough of these goods. England, at present, is Chemnitz's best glove customer. Another novelty, not so very nice, in my opinion, is a plush with leather trimmings. Quite large quantities of these are being taken. It might pay to put in orders for gloves as soon as this letter is seen. A rise in prices is sure to come. Orders are so numerous, now, and are arriving so fast, from England, the East, Australia, Russia, the Continent, even France, and the States that to fill anywhere near on time will be impossible. The cheap line orders will have to suffer.

Limbach, Hohenstein and Chemnitz are running full time in every mill on every machine, on underwear. Prices are good. Raw materials, especially woolen yarns, have advanced. If any line could stand an advance, this line could. Buyers will have to put up the difference because of the boom in orders. Books are full now for months ahead. Only long-time deliveries can be taken. I wish I were able to forsee the results in this line for a few years. It is astonishinng how happily things have turned. Most of the goods going are regulars; but in high grades, nice silks, half silks, lisles, etc., fancy fronted and trimmed goods have gone and are going instead of sporting articles. Cut goods have not gone to the States, in a long time. Canada and the Continent continue to take them. Why they are not popular among your people is a mystery. The goods turned off by William Janssen and other manufacturers of this city will hold their own with many full fashioned regulars. Buyers are looked for along towards the end of April or early in May. A new tulle mill was opened here during the winter. It is already rivaling Plauen's mills; taking much of the trade that once went thither. A new mill is in course of construction. It is expected to be

running about July 1st. Machine makers are the best off men here. In 1898, Germany sent to the States: Half silk goods, wraps, etc., 900 tons, worth 20,100,000 marks; woolen cloth and other woolen, 1,401 tons, worth 9,200,000 marks; cotton hosiery, 3,400 tons, worth 18,600,000 marks.

BROWN.

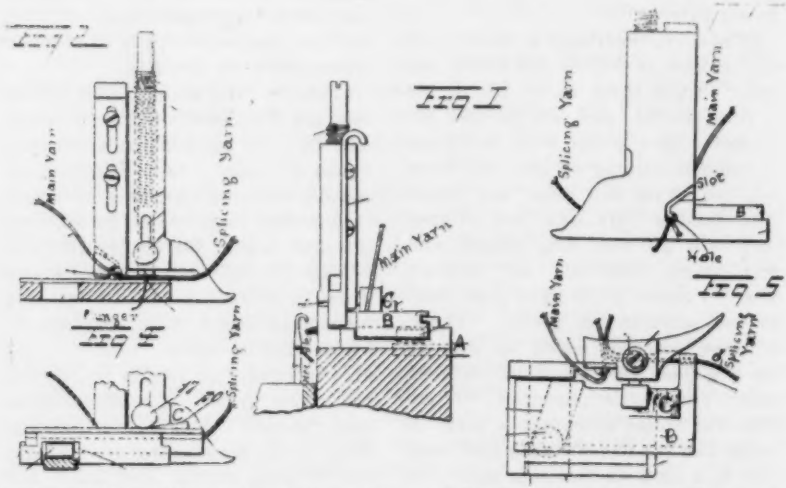
—Certain improvements in the construction of rib knitting machines have been made by Andrew E. Vaughan, Philadelphia, one object of which is to promote the production by substantially continuous operation of a stocking, having a ribbed leg and a plain foot, with seamless heel and toe pocket. Another object is to provide for the proper taking up of the slack web constituting the heel or toe pocket, as this is being formed.

—Soap may be used with flour, starch, dextrine, glucose, carrageen moss, tallow, oil, and china clay; as, in addition to lubricating the starchy matters, it dissolves tallow and oil, and forms them into emulsions which mix well with the size paste.

—The problem of power generation and distribution is an essential factor in determining the design and operation of manufacturing property.

Striping and Splicing Attachments.

We show, herewith, certain ingenious devices for striping and splicing, to be attached to circular rib knitting machines, whereby an extra thickness of the fabric is secured at any desired point—such, for instance, as half-way around the knee of a stocking or around the heel. The object is to provide an attachment for this purpose in which the splicing-yarn will be broken or parted at the proper time, the break occurring near the hole through which the main yarn is fed, so that the end of the splicing-yarn may be readily taken up.



By reference to the accompanying five illustrations, a good idea may be had of the nature of these attachments. Figure 1 is a side elevation of the attachment, in connection with a portion of a knitting machine. Figure 2 is an outside elevation of a section of Fig. 1. Figure 3 is an inside elevation. Figure 4 is an elevation opposite to that of Fig. 3, and Fig. 5 is a plan view of the attachment.

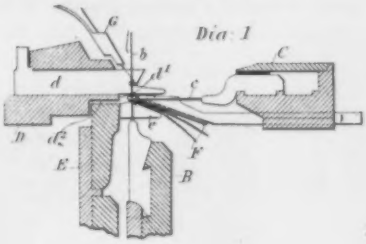
To facilitate the threading of the needles, should the main yarn be accidentally broken, a slot is extended from a hole, as shown, outwardly. This slot is normally closed by a plate, mounted to slide vertically. The splic-

ing yarn passes under a clamping device mounted to move vertically. In the operation of the machine, when the part designed to be reinforced, or thickened, is reached, the rod A is moved inward to move the plate B in a direction to cause the cam, or incline, C, to raise a plunger, and thus release the splicing yarn, and this movement of the plate will feed the yarn through the hole. The needles will then take up the splicing yarn with the main yarn, and the knitting will continue until the knitting of the thickened, or reinforced portion is reached, when the rod A will be drawn outwardly, causing the plate B to move in a direction to lower the plunger on to the splicing yarn, thus clamping it in position. The rotary movement of the part carrying the needle will break the yarn adjacent to the hole, leaving the end projecting, to be subsequently taken up. By placing the plunger close to the hole, as shown, the splicing yarn will be broken, or separated, that is, when the plunger is brought down, the yarn will be drawn around the edge of the hole in such a manner that it forms a hitch, which causes the yarn to break.

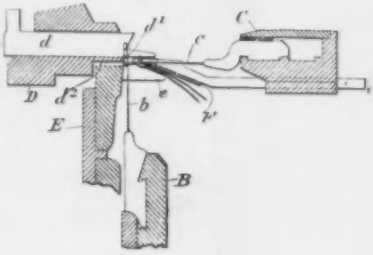
Knitting Machine for Tubular Fabrics.

We illustrate, by diagrams, the cycle of movements of certain knitting devices to produce tubular work, on straight-bar, bearded-needle, knitting machines, such as stockings, socks, vest and shirt sleeves, pant legs, and the like, as well as fashioned tubular work, with a selvage opening, or division, as when making pants in halves, and also complete pairs of pants, without seams.

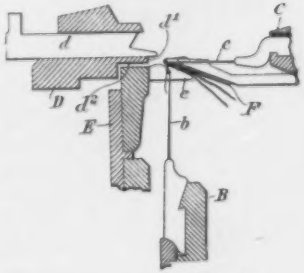
We have not thought it advisable to show the mechanism of the machine, and have confined ourselves purely to showing the action of the most essential features of the machine, demonstrating how the operation of knitting is accomplished. These diagrams will make clear to any practical knitter, the combined action of the vital parts of the machine, showing the progressive movements of the knitting instruments, during one rotation of the cam shaft, in which time a complete course is formed on each row of needles, and such courses are joined at the end needles, and form tubular work.



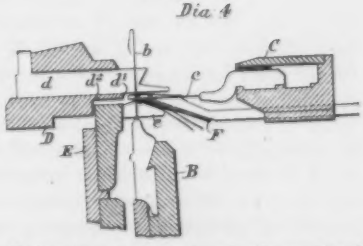
Dia. 1



Dia. 2.



Dia. 3.

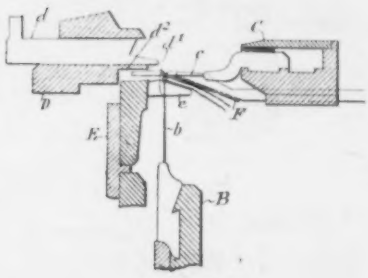


Dia. 4

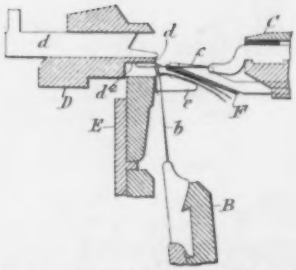
Referring to diagram 1, the vertical needles are at their highest position and the thread-carrier has passed from left to right, laying the thread on

their stems, and the sinkers have indented and divided the thread, as usual. At this stage the horizontal needles are inactive. Diagram 2 shows the needles pressed and the formed loops landed onto their beards. Diagram 3 shows a further descent of the needles, the knocking-over bits having come into action and cast off the formed loops. Up to this point the vertical needles have operated to form a course, as in ordinary machines. The next step in the cycle is to employ the needles for receiving the thread for the horizontal needles. To this end they rise to the position of diagram 4, when the thread-carrier is moved from right to left, laying, as before, a thread upon their stems, which thread is indented by the sinkers, as in diagram 1. The horizontal needles, hitherto quiescent, have now commenced to move in order to receive the indented thread from the needles. Diagram 5 shows the needles in the position for laying the thread upon other needles, the knocking-over bits having been lowered to allow of the needles being moved under the presser to receive the thread from the vertical needles.

Dia: 5

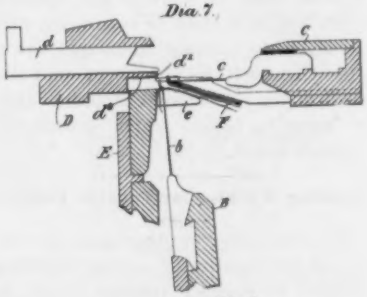


Dia: 6.

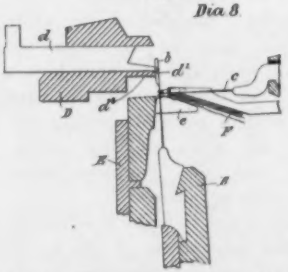


beards upon the indented thread, as indicated by diagram 6. The formed loops on the stems of the needles are next, while the beards of those needles are pressed, landed on the beards. For this purpose the needles move back to the position of diagram 7 through the knocking-over slide. In order to free the vertical needles from the indented thread just laid on the horizontal needles and at present held in the beards of the vertical needles, these latter ascend and move forward to be pressed, as seen at diagram 8. Meanwhile the needles are rocked upward to land the indented thread in contact with the vertical needle-stems onto the beards of those needles, as shown at diagram 9. The needles now descending free themselves from the The rocking of the needles next brings the indented thread under the beards of needles, which are now rocked to press those needles into contact with

Dia 7.



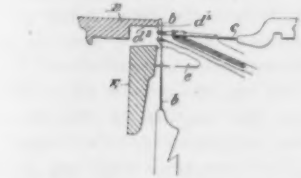
Dia 8.

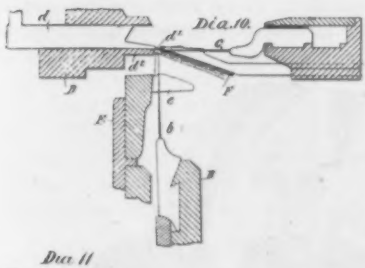


the pressing-surface and close their indented thread, as shown at diagram 10. The knocking-over slide, which coacts with the horizontal needles, then moves forward beyond the heads of the needles and knocks over the formed loops of the needles, as shown at diagram 11. At the same time the

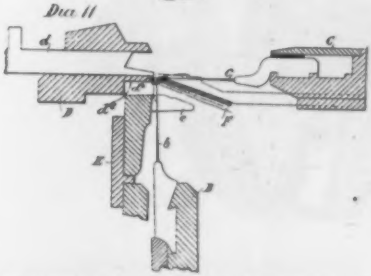
knocking-over bits commence to rise for the purpose of assuming their active position, as in diagram 1. This completes the cycle of motions of the

Dia 9.





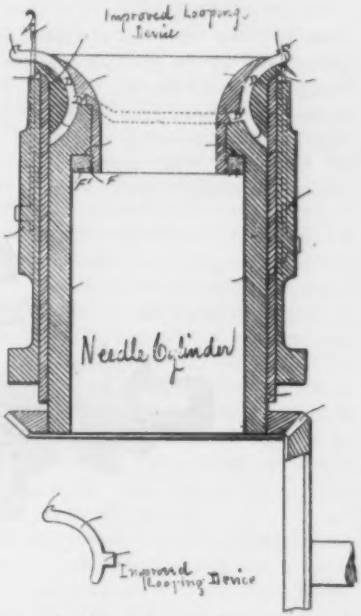
Dia 11



knitting instruments, which motions are recommenced by the rising of the needles to the position shown in diagram 1.

Circular Knitting Machine.

We give an illustration of a recent device, invented by an English knitter, applicable to circular knitting machines, employed in the production of seamless hosiery, and other tubular fabrics. The object of the mechanism is to engage and hold down the loops as they are formed, and prevent them rising with the needles, as the latter are raised into position to take the thread. The loop-holding devices are curved, or circular in shape, so as to form an arc of a circle, and are furnished with a hook or nose at their upper ends to engage the newly formed loops and hold them down while the needles are rising into position to take the thread for the next course. The loop-holding devices are also provided at or near their other end with a heel or butt to be actuated by a cam.



The inner face of the loop-holder cylinder is curved to coincide with the shape of the loop-holders.

The loop-holders when not engaging the loops are prevented dropping out of their tracks or grooves by, and receive their motion from, a cam-ring, which may be formed in two parts.

—Glycerine is one of the waste products from soap manufacture, and remains in the spent lye when the soap has been salted out. It is a dark-brown, viscid liquid, with a sweet taste. It is a deliquescent body, and is a very good softening agent, if not the best softening agent upon the market. Its use is restricted by the fact that if placed in a size mixing in large quantities it makes the cloth have a sticky feel. Usually it is the commercial brown glycerine that is used for sizing purposes.

POWER DEPARTMENT.

ELECTRICITY—STEAM—WATER.

Frisbie Patent Friction Clutches and Clutch Pulleys.

We furnish, herewith, two illustrations showing the form of clutch and pulley built by the Eastern Machinery Company, New Haven, Conn. The numerous advantages of friction clutches, for operating machinery of all kinds, are well known, and now almost universally acknowledged. By their use, perfect control may be maintained over the machinery, in every part of the factory. When used on main line shafts, each department may be started or stopped at will, independent of every other department. This is especially desirable when repairs become necessary in any particular room, or division. In the event of any portion of the works running overtime, other parts may be stopped, resulting in a saving of power and wear of belts and shafting.

Friction clutch pulleys are of great advantage on line shafts to drive countershafts, on countershafts to drive individual machines, and on one part of a machine to drive another. Any machine driven with a friction clutch may be started or stopped instantly or gradually, at the will of the operator. They are a perfect substitute for tight and loose pulleys with shifting belts, doing away with this source of annoyance and the expense of renewing belts so often. The larger the belt the greater the benefit.

Where gas engines of the larger sizes are employed they are almost absolutely essential. They are very useful in every kind of service where it is desirable to start and stop the power frequently or occasionally without interfering with the surrounding plant.

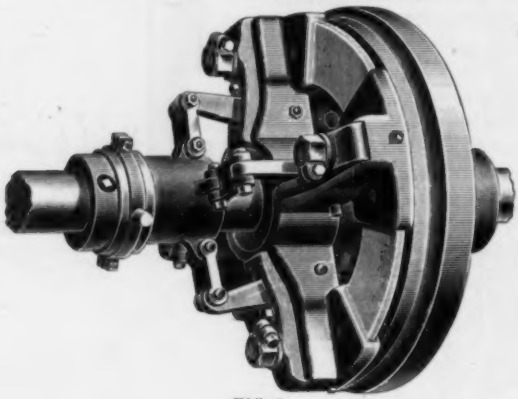


FIG. 1.

All clutches, however, are not alike or equally good. There are various grades and the lowest in first cost are not necessarily the cheapest in the end. Those cheapest in price are often light in weight, of poor material, overrated as to power, or poorly built. It does not pay to use poor friction clutches at any price.

Figure 1 shows the regular cut-off coupling of the Frisbie Clutch, with sleeve drawn out, and the friction surfaces gripped tightly together. Besides their use as cut-off couplings these clutches are adapted to an infinite variety of uses. Pulleys, gears, chain wheels, rope sheaves, etc., of a great variety of styles may be keyed to the back hubs of the clutch rings. The clutch rings may be cast without

hubs and bolted to drums of hoisting machinery, large pulleys, and many other arrangements.

Figure 2 represents the Frisbie pulley, with clutch attached. These pulleys operate in a perfect manner on all machinery moved by wheels, without loss of power, with no end thrust on the shaft, run without noise, and very little wear. They do away with all shifting of belts on tight and loose pulleys. They are simple in construction, readily understood and easy to adjust. They are equally good for high speed or slow speed shafting, for heavy or light work. The variety of application is entirely unlimited and they are a source of profit wherever used. It will be observed, therefore, that they are no new and untested invention. Each part is finished to templates or jigs in a first-class manner, and every part of the same number interchangeable.

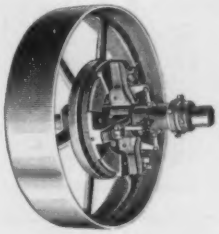


FIG. 2.

Among the many using the Frisbie pulley and clutch, we may mention the following: Dunham Hosiery Company, Naugatuck, Conn.; King Phillip Mills, Pocasset Manufacturing Co., Kilbourn-Lincoln Co., Fall River Bleachery, Laurel Lake Mills, Fall River, Mass.; American Carpet Lining Co., Boston; Pacific Mills, The Farwell Bleachery, Lawrence, Mass.; Boston Manufacturing Co., Waltham, Mass.; Farr-Alpaca Company, Holyoke, Mass.; Merrimack Print Works, Lowell, Mass.; Amoskeag Manufacturing Co., Manchester Mills, Manchester, N. H.; H. W. Butterworth & Sons Company, Standard Machine Co., George V. Cresson Co., Thomas Dolan & Co., John Bromley & Sons, Philadelphia, Pa.; B. B. & R. Knight, Granger Foundry & Machine Co., Riverside Worsted Mills, National Worsted Mills, Atlantic Mills, Wanskuck Co., and Saranac Worsted Mills, Providence, R. I.

Telephone Systems in Mills.

The successful concerns are usually those that adopt, ahead of their competitors, improved methods and appliances which the advances of science make possible. Every mill man is familiar with the telephone in connection with an exchange system or long distance conversation, but comparatively few have applied its convenience and time saving advantages in their own plants. Some, no doubt, have the idea that the telephone is a part of a great system and do not appreciate that at the present time private systems can be installed in mills at much less expense than is generally supposed, which infringe no patents and which pay no tribute, in rental or royalty, to any company. A number of textile plants have these systems in use, to their great satisfaction.

A comparatively recent installation, which shows the advantages of such a plant, is at the Atlantic Mills in Olneyville. In the system employed there, there are ten telephones or stations connected with the desks of different persons in the office, and upwards of forty different stations throughout the mill in the different departments. The system is so arranged that any one of the office stations can call up and speak with any other station in the office, and three of the office stations, viz., those of the higher officers, can call up any one of the stations in the mill or any mill station can call up either of these three office stations. In this way the manager or superintendent can be in immediate communication with any department in the mill. He can give his instructions personally without leaving his desk, and any information that he wishes to receive from any of the overseers can be obtained in the same convenient manner. If an overseer

wants to make an inquiry, he does not have to leave his room or send a messenger, but simply calls up the office. The convenience of such a system is apparent to any mill man.

Now as to the cost. In this large establishment, five messenger boys were kept constantly employed in running errands and transmitting messages from the office to the different rooms in the mill. By the use of this telephone system, four of these boys can be dispensed with, and the saving in wages alone would about pay for the installation of the system, without taking into consideration the saving in time and useless physical exertion on the part of the higher officials, which cannot easily be measured in dollars.

There are comparatively few firms making a specialty of this work for mills, and in order to obtain the best results it should be entrusted to those familiar with the work. A great deal also depends on the kind of instruments used. For this kind of work the Swedish telephones have a well earned reputation. They are employed very largely on the Continent of Europe, and indeed, in the last few years have been widely introduced in this country. Mr. F. O. Plummer, of 620 Atlantic Ave., Boston, has recently secured the New England agency for the Ericsson Swedish telephone, one of the leaders. Mr. Plummer is also a specialist in mill work, having been for a number of years at the head of the firm of Plummer, Ham & Richardson, of Worcester, who have installed many of the most successful factory systems. He has recently established himself in Boston, and would be pleased to furnish information and estimates in conpection with this work.

—Few chemical discoveries have had a greater effect upon textile industries than the process of mercerization, and it has been found to be of greater importance than even the inventor himself had any idea of.

Employees' Time Recorder.

We give, herewith, an illustration of the latest improved employees' time recorder, made by Nanz & Co., 116 Chambers Street, New York. It represents a numerical recorder, especially suitable for large manufacturing and mercantile establishments.

It does not require the time and ability of the employee to sign his name. Each employee has a numbered key. When registering, he simply

inserts it in the recorder, and by giving it a slight push, the bell rings and his number and time is recorded in full view. The key need not be turned. After having registered upon arrival, the employee hangs his key upon the in-board and after registering when leaving hangs it upon the out-board, thus it can readily be seen whether an employee is in or out.

We think the absolute necessity of having time recorders of this kind must be evident to all manufacturers. The moral effect of such an instrument is as great as its money saving value. It makes the employees more

prompt in their attendance to their duties, and keeps an accurate and unprejudiced record of their time. The manufacturers of this recorder make, also, a numerical and autograph time recorder, that is positive in action and easy of operation.

The Advantages of the Electric Driven Cotton Mill.

Paper presented to the New England Cotton Manufacturers' Association, April 27, 1899, by W. B. S. Whaley.

It is the purpose of this paper to describe the advantages that may be gained by the operation of a mill by electrical transmission of power.

Taking these in their order, we first find a greater economy in floor space, due to the absence of belt or rope ways, or towers, which gives an advantage in the greater compactness of the machinery space, and the entire absence of any attention to this department. The substitution for these of the wiring for the motors and the suspending of the motors throughout from the beams overhead, requires no special attention and occupies no floor space. The large belts are entirely superseded by smaller ones, easily put on, and suitable for the sub-division of the power and size of the motors which seldom exceed in good practice today, where a mill in the beginning is designed for electrical transmission, 150 horse power in size and consequently a six-inch belt is the largest belt that would be used, when one belt is taken each side from each end of the motor.

Secondly, in the greater convenience and flexibility in the distribution of the power; the wires being run overhead on the ceiling take up practically no space and they can be conveniently carried to any place in the building. The motors are designed of suitable size according to the sub-division of the different departments. In the best practice, the power of each motor would be limited by the smallest size of shafting suitable to span the bay to which the mill is built, with the advantage of shafting of uniform size throughout the plant, and complete duplicity in size of hangers, and bore of pulleys. The only variation from this necessary would be the receiving shaft from the motor, which would be made heavy enough to stand the strain of the larger pulleys receiving the power. The turning of angles, where required is more conveniently done by means of a motor driving the shaft so placed, than by means of mule pulleys or other gearing, with the advantage of increased friction. The transmission of power to adjoining buildings, or buildings apart from the main building, is more conveniently accomplished by means of the electric motor, than the usual methods of belt holes or shafting through wells or exposed shafting or outside gearing, with the advantage of more complete isolation and less fire risk in these departments.

Thirdly, the power for the different departments being distributed by independent motors, the variation in speed due to the operation of the different machines is not felt beyond the sub-division of the power driving that department, and consequently the efficiency of each department is maintained at its maximum. The pickers and openers being generally the machines requiring the greatest amount of power per machine, the variation in power due to the starting or stopping of the machines, does not affect any other department; and the convenience of being able to shut down or run this department ahead, without interfering with the balance of the mill, is an advantage. Similar advantages may be claimed for all the other departments throughout the mill. Should the necessity arise for operating any section longer than the rest of the mill, or stopping any part of the mill, there is a considerable gain effected in the saving of all unnecessary friction in operating idle shafting and loose pulleys. The uni-

form rotary motion of the motors, and consequent steady speed, permits a greater efficiency in the machinery resulting in larger percentage of production, and more uniform tensions, and considerable reduction in the wear and tear and supply accounts.

Fourthly, with regard to the necessary attention required by the power plant and distributing motors, there is considerable economy. The electric generating plant, having no connection with the mill, except by means of conducting wires, is much more easily and cheaply maintained than the usual method of driving by means of ropes or belts, and fly wheel. There is no dust, dirt or lint being continually stirred up by fly wheel and belts, requiring constant attention to keep machinery in the power plant clean. There is no pull on the bearings, due to unnecessary straining of ropes or belts and consequent heating of journals and waste of oil. The entire generator simply turns in its bearings with its own weight, and consequently the oil is reduced to a minimum, and there is no external cause to produce heating.

The motors in the mill are easily maintained, and are oiled no oftener than it is necessary to oil shafting in good practice, they being extremely economical in this respect, and the only attention that they require is to free them at times from excessive accumulations of lint.

The foregoing applies to electric driven mills that are designed in the beginning for electric transmission, but not to mills where electric transmission is substituted for ropes and belts, because there can be no saving in initial expense of rope or belt ways, nor can the sub-division of the departments be as economically arranged for maximum efficiency. It is invariably the case in instances where electric power is substituted for direct driving, that the motors are placed on the receiving shafts in place of receiving drums, and no flexibility is gained throughout the plant, except in so far as the isolation of departments driven from separate head shafts; and in many cases it is a question whether any advantage could be gained, unless such advantage could be shown in power cost. In many instances, investors are misled by the price of current per unit of power, and the average mill man may be liable to figure this as economical, where in many instances the price quoted appears to be very low; the actual cost of the power is really higher when wear and tear and depreciation (which is low in an electric driven mill), heating and attendance, are added to cost of current. And, where the mill is designed in the beginning, the price quoted may often be made economical owing to the initial saving in the cost of the plant; the same price would not be economical for many modern mills already geared with steam or water.

Auxiliary Power Plants, with Electrical Transmission, at Grosvenordale and Lyman Mills.

Paper read by Frank P. Sheldon at the April meeting of the New England Cotton Manufacturers' Association.

Both these installations of auxiliary power furnish some points that may be interesting to manufacturers, the problems presented being of a nature that may often arise in mills where the water power is fluctuating and inefficient.

At Grosvenordale, the problem presented was this: there are three separate falls on the stream, at each of which was located a mill. The upper fall has about 1100 horse power, the central one about 300 horse power, the lower one about 450 horse power. The mill at the central privilege was too small to be operated with profit (about 17,000 spindles), and it was decided to dismantle it, and utilize the power for an electric light and power station for the other two mills. As the water power of New England streams as a rule is low in the summer months and lighting is wanted chiefly in the winter months, the con-

ditions of the supply and demand for power and for lighting fitted the conditions of the two seasons very well.

Having the electric light plant installed, it was a simple and comparatively inexpensive addition to it, to install motors for supplying power. The same apparatus at the electric station and the same wiring to the mills would be used, and the only additional expense would be for the motors. The cost of the power transmission plant alone was less than half what it would be if the whole plant had to be installed for power only, and several times less than it would be if the water power had also to be developed. In the latter case the cost would be prohibitory as compared with steam power, which is produced at these mills at very low cost. All the conditions in this case seemed to fit admirably with an electric plant for lights and power and it was decided to make the installation.

The electrical equipment at the central station consists of two 150 kilo watt two-phase alternating generators, 2,200 volts, with proper exciters, marble switch-board and instruments. At the lower mill were placed 1,000 sixteen candle power lamps, with two 500 light transformers. At the upper mill were placed 2,200 sixteen candle power lamps, with four 500 light transformers and two 250 light. Also, two 100 horse power two-phase rotary field motors, speeded at 720 revolutions per minute, located in the engine room and belted direct to one of the main jack shafts. Also a 10 horse power motor in the cotton house.

The line consists of four No. 6 wires to the lower mill, about 1,800 feet distant, and four No. 4 wires to the upper mill, about 6,000 feet distant.

The equipment was guaranteed to operate successfully under a maximum variation of 3 per cent. in speed of engines at the upper mill, and of 5 per cent. of the water wheels at the electric station. The results have proved entirely satisfactory. The motors have often worked at 30 per cent. and 40 per cent. overload.

The Lyman Mills plant requires about 2,200 horse power to operate it. The water wheel plant is capable of driving the whole mill, when there is plenty of water. But in the year preceding the installation of the auxiliary power, the stoppages of the machinery from deficient water had reached a serious and intolerable point, and it was decided to install some sort of auxiliary power.

It was impossible under the existing conditions to locate an engine where its power could be taken directly by belts to the places where it was wanted. And as the amounts needed in any one point were small, there seemed to be no way to accomplish the results except by electrical transmission.

The two-phase system was selected for these installations, in preference to three-phase, because a large proportion of the current is used for lighting, and it seemed to be more important to gain the good regulation for this purpose by the use of the two-phase system, than to save copper in the line by the use of three-phase.

The results attained by this installation are.

1st. Ample auxiliary power to enable the mill to maintain full speed and product.

2d. Its concentration in one place, and distribution to the several points where needed, by mechanical transmission where it is possible and by electrical where it is not; thus combining the economical advantages of the former with the convenience and divisibility of the latter.

3d. An electric lighting plant for the entire plant by a small additional outlay.

—Glucose, which is now rarely used as a sizing material, is prepared by the inversion of starch by means of sulphuric acid.

—The explanation of the chemical action of caustic soda on cotton given by Mercer is still current.

What Belting is Made Of, and its Care.

Paper read by Philip Dana at April meeting of the New England Cotton Manufacturers' Association.

The standard leather belting to-day is undoubtedly the oak tanned leather belting so universally used in cotton and woolen mills. Nothing seems able to take its place.

Cotton woven, wire woven, rubber and numerous other kinds of belts have been tried and have failed to last, to transmit as much power or give as general satisfaction as the leather belt, except in cases of extreme moisture or steam as in a dye house, where rubber belts have succeeded the leather ones.

Steer hides from Texas and the western states are largely used for the best belts. The center of the hide from the shoulder nearly to the tail, the lower part of the sides and the belly being cut off, is used for the best belts, as this is of fine grain and solid, stretching but very little.

The very center of the hide, about twenty inches in width, and from four and a half feet to five and a half feet in length, according to the size of the butt, is used for the larger belts. The strip on each side of this a few inches wide is used for the smaller belts.

The hide from the neck, the lower part of the sides and the belly being coarse and spongy, stretches badly and is not used in the best grades.

It takes six months to properly tan leather. It is then stuffed or curried with tallow to make it firm and pliable. This keeps it from cracking and adds considerable to the weight. After being curried, which is quite a complicated process, it is stretched until nearly all the stretch is taken out.

The strips of belting should be put together by short laps six to eight inches long. A longer lap makes the belt stiff and is more apt to include a poorer part of the hide.

In putting laps together, I prefer the use of cement only. We find that rivets wear off, catch and come out, spoiling the surface of the belt and letting it drop to pieces long before it is really worn out. It is the same with double belts, which are stitched on both sides; the stitches wear out long before the belt does, letting the belt drop to pieces. The stitches also spoil the smooth surface of the belt.

As regards the life of a belt little can be said with accuracy, so much depends on the conditions in which it is used. A large driving belt on large pulleys and not overloaded should, if properly cared for, last from twenty to thirty years. Cone belts do not last more than two or three years, and some a much less time. A belt constantly running from a tight to a loose pulley of course gets racked a good deal and cannot last more than ten to fifteen years. In a room full of dirt, like a card room, belts should be carefully carded and then dressed very lightly once a week.

In figuring for main drives, if possible, the slack should be on top instead of underneath the pulley. This allows more belt to rest on the pulley, resulting in less slipping, and more power can be had with a slacker belt.

—A simple kind of weaving seemed to have been practised by prehistoric man at a very early stage of his development, and the first representation they possessed of an upright loom was dated 1600 years before.

—So early as the 13th century Paris became noted for its silk-weaving factories, and in the end of the fifteenth century, under the favor of the King, Francis I., the workmen were encouraged to seetle down in the towns by being exempted from taxes and other burdens. Lyons became the chief seat of the silk manufacture.

—It is impossible to say when Scotsmen first began to spin and weave fabrics of flax and linen, as they seemed to have worn these from the earliest recorded times, so that, while the manufactures of textiles from wool, silk, and cotton were imported arts, those of flax and linen were indigenous.

DYEING DEPARTMENT.

Dye Recipes for May.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $3.

RECIPE NO. 65.

Blue on Cotton Yarn.

Chicago Blue 6 B on 100 lbs. of cotton yarn.

Prepare dye bath with

2 to 4 ozs. Glauber's Salt, ¼ oz. Soda Crystals, per gal. of dye bath;

or

20-25 lbs. Glauber's Salt.
2-3 lbs. Soda Crystals.
1 lb. Chicago Blue 6 B.
(New York & Boston Dyewood Co., 58 Beekman St., New York.)

Enter goods at 170°-180°, give several turns, bring to a boil, and boil one hour or to shade. Chicago Blue 6 B is a direct cotton color, and produces a remarkably pure and green shade of blue. It has a high coloring power, 1/50 lb. producing a decided blue tint on 100 lbs. of cotton.

When treated with Copper Sulphate 3 lbs. to the 100 of material, at 160°-175°, a brilliant green shade of blue is obtained, which is distinguished by its fastness to light.

RECIPE NO. 66.

Claret on Worsted Yarn.

Fast Claret on 100 pounds worsted yarn.

Prepare dye bath with

3 lbs. Fast Claret No. 135.
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter yarn at 140°, bring to boil while turning, and turn to shade at that heat.

For dyeing clarets, maroons, etc., Fast Claret will be found of great value, being a color that will readily dissolve, dye even shades, and penetrate the fibre.

RECIPE NO. 67.

Carmine Red on Worsted Yarn.

Azo-Acid Carmine B on 100 lbs. of worsted yarn.

Prepare dye bath with

10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.
2 lbs. Azo-Acid Carmine B.
(Victor Koechl & Co., 122 Hudson St., New York.)

Introduce yarn into bath at 160°-170°, bring to a boil, and dye at this temperature for at least one hour, with frequent turning.

Azo-Acid Carmine B is remarkably fast to washing, and toward light is one of the fastest of azo-reds. It has excellent equalizing properties and with smaller amounts, gives a desirable bluish pink.

RECIPE NO. 68.

Dark Blue Black on Worsted Yarn.

Logwood Liquor for Wool on 100 lbs. worsted yarn.

Prepare dye bath with

10 lbs. Logwood Liquor for Wool.
(Stamford Mfg. Co., 133 Front St., New York.)
3 lbs. Blue Vitriol.
3 lbs. Copperas.
3 lbs. Oxalic Acid.
½ lb. Acid Violet 5 B.
(John J. Keller & Co., 104 Murray St., New York.)

Enter yarn at boil, and turn 1½ hours at that heat.

The shade here given is well suited for dyeing heavy suitings and cloakings, also for raw stock. The color is fast and quickly dyed, which will have a deal to do in making the material free from harshness. Logwood Liquor for Wool is also well adapted for producing fine shades of black on wool, over a chrome mordant. (See recipe 54 for another shade of dark blue black).

RECIPE NO. 69.

Brown on Cotton Yarn.

Diamine Brown V on 100 lbs. cotton yarn.

Prepare dye bath with

3 lbs. Diamine Brown V.
(Wm. J. Matheson & Co., 182 Front St., New York.)
20 lbs. Common Salt.
2 lbs. Soda.

Enter yarn at boil, and turn one hour at that heat.

Diamine Brown V, like Diamine Brown M (see recipe 60, April), dyes a perfectly level shade of brown, of a somewhat darker shade, and not so red. Dyers will find both brands very useful for dyeing straight shades, and in combinations.

RECIPE NO. 70.

Violet on Woolen Yarn.

Acid Violet 5 B Extra on 100 lbs. woolen yarn.

Prepare dye bath with

½ lb. Acid Violet 5 B Extra.
(John J. Keller & Co., 104 Murray St., New York.)
4 lbs Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter yarn at 140°, bring to boil while turning, and turn to shade at that heat.

We show in this recipe a full dyeing on woolen yarn, of Acid Violet 5 B Extra, which will convince dyers that it is a fine and strong color, as well as a pure one. (See recipe 35, March).

RECIPE NO. 71.

Light Green on Cotton Yarn.

Direct Green B C on 100 lbs. cotton yarn.

Prepare dye bath with

1 lb. Direct Green B C.
(Stone & Ware Co., 157 Maiden Lane, New York.)
10 lbs. Common Salt.

Enter yarn at boil, and turn one hour at that heat.

Direct Green B C dyes a light and bloomy shade of green, and it being a one-dip color, will combine with other direct dyes for combination shades. For standing kettles, less color is required.

RECIPE NO. 72.

Black on Woolen Cloth.

Martial Black B on 100 lbs. woolen cloth.

Start bath with

26 lbs. Martial Black B.
(Sykes & Street, 85 Water St., New York.)
2½ lbs. Oxalic Acid.
2½ lbs. Muriatic Acid.
2 lbs Fustic Extract 51 deg.

Boil for 2½ hours, then wash thoroughly.

This dye offers exceptional advantages in cost of dyeing, ease of application, and resistance to light. It can be used equally well upon a chrome mordant, and when thus used, the shade is richer, and from 15 to 20 per cent. less black is required. We think that when a large batch of material is colored, it would require a less quantity of dye. Ready for use, the color of the dye bath is a dusky, or dirty reddish violet, and, if after the goods are entered for a few minutes this becomes bluish in tone, more muriatic acid is required. The best plan is to add the muriatic acid to the dye bath only after its addition is shown to be necessary. The skill and judgment of the dyer will suggest to him such methods as will give the best results for the class of work he is engaged in. The fustic is used to intensify, or deepen the black shade. The quantity to be used, of course, depends upon the shade desired. For standing bath, use 18 lbs. Martial Black B. with the same proportion of the other ingredients.

RECIPE NO. 73.

Red on Woolen Yarn.

Carmoisine N R on 100 lbs. woolen yarn.

Prepare dye bath with

2½ lbs. Carmoisine N R.
(John J. Keller & Co., 104 Murray St., New York.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter yarn at 140°, bring to boil while turning, and turn to shade at that heat.

Carmoisine N R dyes a level shade

of a fast red, and will combine readily with other acid dyes, for producing different shades. It works slowly and level on the fibre, resulting in even dyeings.

RECIPE NO. 74.

Blue on Woolen Cloth.

Acid Blue F S on 100 lbs. of woolen cloth.

Prepare dye bath with

10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.
2 lbs. Acid Blue F S.
(Victor Koechl & Co., 122 Hudson St, New York.)

Enter material at 140°-150°, give several turns, bring to a boil and dye at this temperature for one hour.

Acid Blue F S may also be used on a chrome mordant.

Acid Blue F S gives a good full blue; dyes slowly and evenly; is extremely fast to washing and soaping, and does not stain white wool or cotton.

RECIPE NO. 75.

Brown on Woolen Cloth.

The Amend Mordanting Process for 100 lbs. of Woolen Cloth.

(Controlled by the Amend Process Co., 205-211 Third Ave., New York.)

Prepare bath for mordanting with

6 lbs. Acetic Acid 30%.

Work the cloth one-half hour at 140° F., lift the material from the bath (unless the dyeing machine is so constructed that additions may be made to the bath without danger of uneven dyeing), and add

1 lb. of Chromic Acid.

previously dissolved in water.

Work the cloth after the addition of the Chromic Acid one-half hour, allowing the temperature of the bath to drop. At the end of this period

6 lbs. of Bi-Sulphite of Soda,

are added to the bath, and temperature raised to 140°, and the cloth worked for ½ hour at this temperature. Rinse or pass through hydro-extractor and dye in bath containing

15 lbs. of Diamine Brown (paste).
(Farbenfabriken of Elberfeld Co, 40 Stone St., New York.)
¼ lb. of 20% Ammonia.

Entering goods at ordinary temperature, bring to a boil and boil one hour. (See recipe 64, April, for comments.)

RECIPE NO. 76.

Violet on Worsted Yarn.

Guinea Violet 4 B on 100 lbs. of worsted yarn.

Prepare dye bath with

10-15 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid.
1 lb. Guinea Violet 4 B.
(New York & Boston Dyewood Co., 53 Beekman St., New York.)

Enter goods at 180°, bring to a boil and dye for one hour at this temperature.

Guinea Violet goes on the fibre very evenly and is very fast to alkalies.

RECIPE NO. 77.

Light Green on Worsted Yarn.

Kitone Green on 100 lbs. of worsted yarn.

Prepare dye bath with

10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.
2 lbs. Kitone Green.
(A. Klipstein & Co., 122 Pearl St., New York.)

Introduce yarn into bath at 175° to 180°, bring to a boil and dye at this temperature for at least one hour, with frequent turning.

For a color possessing the same brilliancy, Kitone Green is remarkably fast to alkalies and light, and may be considered one of the best acid greens for wool.

RECIPE NO. 78.

Red on Woolen Yarn.

Azo Fuchine G on 100 lbs. wool yarn.

Prepare dye bath with

2 lbs. Azo Fuchine G.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter yarn at 140°, bring to boil while turning, and turn to shade at that heat.

Azo Fuchine G is a well known color among dyers, and is noted for its level dyeings, both alone and in combinations.

RECIPE NO. 79.

Green on Cotton Yarn.

Tolamine Green on 100 lbs. of cotton yarn.

Prepare dye bath with

25 lbs. Glauber's Salt.
3 lbs. Tolamine Green.
(A. Klipstein & Co., 122 Pearl St., New York.)

Enter yarn at 160°-170°, give several turns while raising temperature to a boil. Turn at boiling temperature for ¾ hour, or to shade.

Tolamine Green has a very high coloring power, and is very fast to light and washing.

RECIPE NO. 80.

Black on Cotton Yarn.

Diazyl Black M B on 100 lbs. of cotton yarn.

Prepare dye bath with

30 lbs. Common Salt.
6 lbs. Diazyl Black M B.
(C. Bischoff & Co., 87 Park Place, New York.)

Dye at the boil for one hour.

After dyeing, rinse in cold water and diazotise by working 10 to 15 minutes in a cold bath of

2 lbs. of Sodium Nitrite,

previously dissolved, and

7 lbs. of muriatic acid.

Rinse in water or a bath weakly acidulated with muriatic acid.

Develop by working 10 to 15 minutes in a bath containing

2 lbs. of Developer No. 2.
(C. Bischoff & Co., 87 Park Place, New York.)

previously dissolved in caustic soda 36° Tw. *

In this manner a blue shade of black may be produced on cotton, which stands washing and light well.

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*(It will take about 1 lb. of caustic soda to satisfactorily dissolve 2 lbs. of Developer No. 2.)

New Dyes.

In this issue we give a number of recipes containing new dyes, showing their effects upon cotton and wool. We believe that all of them are entitled to the consideration of dyers.

Dyers will find a very attractive carmine red on worsted yarn, in recipe 67, from Azo Acid Carmine B, obtained from Victor Koechl & Co., New York. This is a new, level dyeing, red azo color, which possesses excellent fastness to light and alkali, and combines equalizing properties with such fastness to washing as, heretofore, has been little known in a red level dyeing azo color.

William J. Matheson & Co., New York, show their Diamine Brown V for a brown on cotton yarn, in recipe 69. This dye is an important addition to the range of Diamine direct cotton dyes furnished by this house so successfully within the last few years. This particular product belongs to the series of fast diamine colors, of which the first member was Diamine Black, which, owing to their great fastness against washing, light, air and acids, have made their way rapidly, even into such industries as formerly could not use the so-called benzidine colors. Diamine Brown V, dyed by itself, gives a deep, full dark brown, and in lighter shades, a claret. It may be shaded with other direct cotton dyes, and will do excellent service as a bottom color, or for mixtures for the production of dark shades.

We have in recipe 71, a light blue on cotton yarn, from Direct Green B C. furnished by the Stone & Ware Company, New York. This dye is chiefly recommended for its brightness and fastness to light.

In recipe 72 will be found a most interesting dye that should receive the attention of manufacturers, furnished by Sykes & Street, New York, and known as their Martial Black B. In this recipe, this dye is used for the production of a black on woolen cloth, and we have no hesitation in saying that the shade of black is a most excellent one. We will not add much to the comments that are made in the recipe. The shades produced are absolutely fast, and entirely free from crocking, unless an excess of black is used.

John J. Keller & Company, New

York, show their Carmoisine N R in recipe 73, for a red on woolen yarn. This dye goes on to wool very level, and is fast to fulling.

In recipe 74 we have a shade of blue on woolen cloth, produced by Acid Blue F S, furnished by Victor Koechl & Co., New York. This is a new product, which dyes well in the usual acid bath, or on a chrome mordant, and is exceedingly fast to light and fulling. It will not stain white wool or cotton, and can be used either alone or in combination with aniline or alizarine colors.

An excellent shade of violet on worsted yarn is to be had by following recipe 76, by the use of Guinea Violet 4 B, furnished by the New York & Boston Dyewood Company, New York. In general, this color is especially valuable for mixed wool and cotton goods, where the dyeing is made in one bath. It has the property of attaching itself to wool in a neutral bath, and can be employed in connection with any substantive colors, which are used to dye the cotton part of the material. This dye can also be used with acid, as noted in the present recipe, and when used in this way, is much faster to washing than the ordinary acid violets.

A. Klipstein & Company, New York, furnish in recipes 77 and 79, two of their popular dyes, namely, Kitone Green and Tolamine Green, respectively. Kitone Green is an acid color, used for wool dyeing exclusively, and possesses the merit of being as fast a wool green to alkali as anything on the market, and is brilliant in shade. Tolamine Green is more particularly for cotton, although it may also be dyed on wool, and in both cases is very fast to washing and light. It may be used for mixed goods, and dyes a uniform shade.

Azo Fuchine G, furnished by the Farbenfabriken of Elberfeld Company, New York, is shown in recipe 78, for a red on woolen yarn. This dye is used in connection with sulphuric acid and Glauber's salt, in the usual manner. It is distinguished by great fastness to light, which is of especial importance in combinations for light fashionable shades. It goes on to the material without the slightest difficulty, which is a property of great importance in piece dyeing. It can be added to the boiling dye bath for shading purposes, without fear of any unevenness resulting. It is also suitable for silk in a curdled soap bath.

In recipe 80, a black on cotton yarn is shown, produced by the use of Diazyl Black M B, furnished by C. Bischoff & Company, New York. This is a new patented color, exceedingly full, giving heavy shades, and standing sunlight remarkably well.

Sabol Brown.

A NEW NATURAL DYESTUFF FROM THE PALMETTO PLANT.

Hardly a week, indeed perhaps hardly a day, goes by without some new color or product from coal tar being brought out, but it is an event of considerable interest when a new natural dyestuff or extract is discovered, and the following report by Professor J. M. Mathews, of the Philadelphia Textile School, on the new dyestuff called Sabol Brown, an extract from the root of the scrub palmetto plant, will doubtless be read with much interest. Professor Mathews finds this substance exhibits the valuable properties of cutch both as a natural dyestuff and as a mordant for logwood and aniline colors. The Palmetto Co., with offices in the Drexel Building, and works in Florida, control this product, and are now in a position to put it on the market.

Preliminary report on dyestuff labeled "Sabol Brown" from the Palmetto Co.:

"This substance extracted from the root of the scrub palmetto plant, exhibits the properties characteristic of cutch, in that it contains both tannic acid and a coloring principle. The color obtained on cotton by the use of

'Sabol Brown,' and the methods of obtaining the same, lead me to the opinion that the coloring principle contained in this substance is identical with catechin, a coloring matter found in the roots of many tropical plants, which is capable of being developed by means of oxidation into an insoluble brown dyestuff known as japonic acid. Cutch has long been employed as a cheap natural product for this purpose; but it presents many disagreeable features in the manipulation; it leaves much sediment and tarry substances in the dye vat which are liable to cause unevenness and specks, but its great drawback is that it causes the goods dyed with it to become extremely harsh and unpleasant to the feel and handle.

"From my experiments with 'Sabol Brown' I can say that it presents all the good dyeing qualities of cutch, without any of the disadvantages arising from the use of the latter. In the first place it readily goes into solution without the production of any annoying sediment in the dyevat. This is a point to which I wish to draw especial attention and emphasis. Secondly, the dyestuff is absorbed by the material gradually, and, consequently, evenly. Thirdly, the colors developed by its use, are comparable both in intensity and quality with those attained with cutch, and change of shade by the use of different metallic salts seems to follow the same rule as with cutch, a circumstance which appears to confirm my opinion that the coloring principles in cutch and 'Sabol Brown' are identical in nature, and probably in composition.

"My investigations and experiments on the dyeing properties of 'Sabol Brown' have led me to the following conclusions:

"It is capable of dyeing cotton in all forms in a manner similar to cutch, that is:

"(1) By immersion for some hours in the dye vat, and after treatment with bichromate of potash, light shades of brown are attained, which have a tone peculiar to themselves, and of considerable beauty.

"(2) By treatment with blue vitriol in connection with 'Sabol Brown' in the dye vat, and after treatment with bichromate of potash, produces a full, dark shade of brown; the depth of color depending on the concentration of the dye-bath.

"(3) By using alum instead of blue vitriol, a lighter and redder shade of brown is obtained, very similar to that produced by cutch. By the use of tin crystals a yellowish shade is produced. Copperas gives a slate color.

"(4) This dyestuff once on the fibre acts as a mordant in the same manner as cutch. With logwood a full deep black is obtained which may be toned to any desirable shade of black by the addition of fustic. With the aniline colors all manner of colors and combinations of shades may be produced.

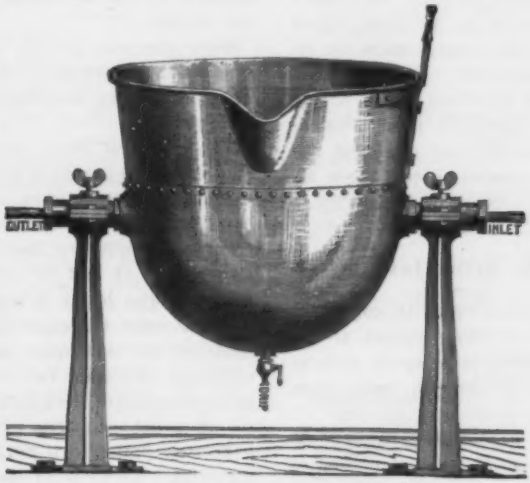
"'Sabol Brown' is best used as a standing kettle, employing additions of ten pounds of dyestuff per 100 gallons of water for each new bath. The oxidizing bath should contain 2½ per cent. of potassium bichromate, calculated on the weight of goods. The possibilities of 'Sabol Brown' appear especially favorable as a good substitute for the cumbersome cutch which has long been sought for by the dyer; and I believe my experiments have fully demonstrated that this new product possesses many, if not all, of the old one, without its unevenness disadvantage."

—Milton P. Brown, boss carder at No. 1 mill of the Exposition Cotton Mills, Atlanta, Ga., has resigned to accept charge of the card room at the Fulton Bag & Cotton Mills, Atlanta, Ga.

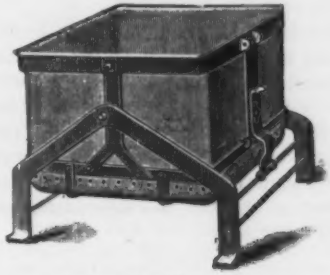
—J. T. Broadbent, until recently clerk in the office at the Lowell Textile School, Lowell, Mass., has accepted a position as spinning overseer with the Mammoth Springs Cotton Mills, Mammoth Springs, Ark.

Improved Copper Kettles for the Dye House.

Sixty-three years' experience in a special line of work is in itself a guarantee that the products of such a concern are of the highest order, for no business could survive for that length of time unless it had been successful in solving the problems which present themselves from time to time. Such has been the history of Thomas Burkhard's copper works, 494-496 Flushing Ave., Brooklyn, N. Y. Mr. Burkhard makes a specialty of all kinds of copper work and special apparatus for dye houses and laboratories. His "Safety" copper steam boiling kettles are noted for their efficiency. Copper being the quickest conductor of heat, it is, therefore, the metal adapted for high boiling, and these kettles are arranged so that the liquid may be brought to a quick and even boil with economy of steam. The severe strain to which the copper steam boiling kettle is subjected while under heavy pressure of steam, renders it most important that the purchaser should be cautious in its selection. Quality, rather than cost, is the first consideration. Burkhard's kettles are provided with his patent steam separator, consisting of a steam metal cross fitted within the steam space, causing the steam to separate in four directions, thereby imparting a more even temperature, and, it is also claimed, to improve the boiling very largely. Each kettle is subjected to a water test of 150 lbs. per square inch, although they are made for a greater or less pressure according to any desired specifications.



The jacketed tilting kettle is largely used by dyers for preparing colors for the dye house. This kettle is claimed to be much superior to the water bath system, and avoids the necessity of charging with water, for the kettle being jacketed, it is heated by steam



BURKHARD'S KETTLE.

only, which enters at one side and on the other the exhaust steam finds its outlet.

The copper tipping dye tanks made by this concern are most convenient for quickly discharging their contents.

Being portable, they can be easily placed in different parts of the dye house, where the exigencies of the work demand.

Among other specialties of these works are copper dippers made of heavy material to stand long and hard wear; copper spray pipes for heating water in tanks, made of iron pipe size copper tubing; stationary dye tanks, made in all sizes, fitted with brass plugs; copper stills for recovering benzine, etc.

Besides the standard types of apparatus most generally used, Thomas Burkhard's works are equipped for any kind of special copper work according to specifications furnished.

Apparatus for Dyeing Loose Stock.

There has been recently contrived, by a resident of Rhode Island, an apparatus for dyeing loose stock, such as wool, shoddy, cotton, silk, noils, rags, etc.

The object of the apparatus is to dye and color stock without polling or taking it out of the apparatus until it is ready for the drier. It is designed to render the dyeing and coloring operation more simple and rapid and economical in the saving of labor and steam and will leave the stock in a better condition for carding and other operations that it may have to go through.

In consists in providing an inclosing casing and a shaft mounted therein supporting a revolving frame, removable boxes or baskets adapted to be carried in the frame, and means for automatically throwing the power mechanism out of operation in case a box or basket becomes detached from the frame.

Imparting Lustre.

Among numerous mechanical methods of mercerizing fibrous material, our attention has been attracted to one gotten up by a resident of England, designed for the imparting of a silky lustre and touch to yarn, etc., while being stretched under pressure. We are unable to give space to the proper number of illustrations to show the construction of the apparatus, but it is a machine having a convenient number of pairs of squeezing rollers at the top of the machine, and a similar number of single rollers, running parallel to the squeezing rollers, at the bottom.

Some idea may be had of the apparatus from a description of the method of operating the machine, which is as follows:

The hanks of yarn, cotton, etc., are placed over top rollers and then slipped under bottom ones, and the machine started by switching the belt from loose pulley to fast pulley. The liquor is next run in until sufficient to cover the lower series of rollers. At this point the material undergoes considerable shrinkage, causing such tension between the two sets of rollers as to necessitate their being constructed of great strength. Any desired squeezing action can be given to the material. As soon as the liquor has been run in, a fan or blower is started, setting up an agitation and oxidation of the liquor through a perforated pipe. The process then continues until the mercerization of the material is completed.

—There are several peculiarities about the mercerizing process which have never been explained. The most remarkable of them is that heat retards instead of accelerating the chemical change.

—Each and every quality of wool has its limit to which it can be spun without the yarn becoming imperfect —i. e., unsound, uneven, and unwearable. In the worsted trade the highest limit to which each quality can be carried fixes the counts, and these range upwards from 32's to 80's, beyond which only the choicer lots are spun.

QUESTIONS AND ANSWERS.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

Fulling Machines and Nappers.

Editor Textile World:

Can you give me the address of the manufacturer of the best fulling machines that will full men's knit goods, say, about 20 per cent. cotton; also, the best napper for gloves? K. B.

As this correspondent does not give his name and address, we should not pay attention to his request, for we do not answer anonymous communications, but as this inquiry is a type of many that we receive asking for the best machines for a certain purpose, we will say that we do not consider it within our province to recommend in these columns any one machine as being the best of its class. There is always an honest difference of opinion in these matters. We do not think it proper to take upon ourselves the authority of passing judgment. Builders of machinery whose addresses are found in our advertising columns will give all necessary information about the advantages of their products, and the purchaser, guided by his own judgment, or that of other manufacturers to whom they can refer him, is best able to make his own choice.

Textile Industry Statistics.

Editor Textile World:

We are preparing some statistics to show the growth of the manufacturing industries for the year 1898, and find that we can find no reliable figures relating to cotton and wool; but, on inquiry, find that your publication is an authority on these subjects, and, therefore, wish to get from you the necessary information, giving figures, of the production and consumption of cotton and wool, or both, in the United States.

N. Y. J. J. S.

The Textile World for 1898 contains much of the information called for, in a concise form, and readily applicable to the purpose named. There are, however, authorities that our correspondent could consult. Among them we may mention the following: Annual Report of the New Orleans Cotton Exchange, for 1898; Annual Report of the New York Financial Chronicle; "Cotton Fluctuations and Movement," published by Latham, Alexander & Co., New York; "Cotton Facts," by A. B. Shepperson, Cotton Exchange, New York; Quarterly Bulletins of the National Association of Wool Manufacturers, Boston, Mass.; "Cost and Production of Cotton," Bulletin No. 16, published by the Department of Agriculture, Washington, D. C.

Cotton Ribbons for Typewriters.

Editor Textile World:

Will you favor me by giving me the names of manufacturers that can supply white cotton ribbons for typewriters, ready to be inked?

Penn. B. S.

Should this inquiry interest any of our readers, we should be pleased to hear from them.

For Dyers.

Editor Textile World:

Will you inform us of the names of dyers of piece goods in New England who can handle eight or nine ounce ¾ goods, making them black by the "carbonizing" process?

N. Y. S. C.

Should any of our advertisers see anything in this of interest, we should be pleased to hear from them. We do not think, however, that our correspondent has stated his wants exactly as he intends to have them appear. Probably he wants to have his goods carbonized before they are dyed.

Gassed Yarn.

Editor Textile World:

I see a great many inquiries for gassed yarn. Will you tell me what it is made out of?

Mass. P. C.

Gassed yarn is simply cotton yarn that has been passed through gas flames, to take off the loose fibres that are on the surface. It is intended to make the yarn smooth and free from loose hairs. This is quite necessary in case the yarn should be printed. Cloths are likewise treated for the same purpose. Especially is this applicable to print cloths.

Heavy Drills Wanted.

Editor Textile World:

Can you inform us where we can buy a medium heavy drill, in black and white stripes, for shirting, at about 6½ cents?

Mo. C. S. O.

We have answered by mail, giving the names of parties of whom these goods can be obtained in large and small lots.

Wool for Sale.

Editor Textile World:

Can you give us the names of parties that are in the habit of buying Maryland wool, of which we have quite a lot?

Md. T. R.

We have given the name, by mail, of a good party in the wool trade, that handles such wool.

Cotton Linings.

Editor Textile World:

I wish to make connection with some cotton mill which can produce cotton lining suitable for men's wear, as I could handle large lots of same. Can you advise me in the matter?

Greene.

If any of our subscribers are interested in the above communication from a well-known New York commission house, we should be pleased to put them in correspondence.

Khaki Cloth.

Editor Textile World:

We notice what you say in your magazine regarding Khaki cloth, and should like to obtain a sample of it, if you will inform us of the source whence we can obtain it.

D. R. C.

If our correspondent will write to the Giveen Manufacturing Company, New York City, he will no doubt have his want satisfied.

Full Fashioned Hose.

Editor Textile World:

I notice in a German letter published by a contemporary in which there is mentioned a full fashioned hose made to sell for $1.25. Is there a machine on the market to make such goods, and, if so, who are the makers?

Nemo.

We are not aware of any machinery for this class of goods except that on the Cotton's patent principle, and believe it would be out of the question to make and sell such goods on such machines at a profit for $1.25.

Spindles in the South.

Editor Textile World:

I desire some statistical information, and would thank you for an estimate on the number of spindles and looms in the Southern States at the present time.

J. R.

From the advance sheets of the Textile World's 1899 Directory, now in preparation, we estimate approximately the number of spindles in the Southern States to be about 4,350,000, and the number of looms 104,500.

Conditioning Yarn.

Editor Textile World:

Can you inform us of a conditioning house, or public examiner, that can examine and report upon single cotton yarn?

N. Y. F. S.

We would suggest writing to the chemist, Laboratory of Technology and Tests, Care Philadelphia Museums, Philadelphia, Pa.

Price for Looping Cotton Hose.

Editor Textile World:

Will you please give me the price paid for looping cotton hose?

Ill. D. O.

The price for looping cotton hose varies greatly in different parts of the country. In Virginia and throughout the South the price is about 1½ cents per dozen; in Pennsylvania, about 8½ cents; and, in Massachusetts and New Hampshire, the price ranges from 7½ to 8½ cents per dozen.

Cotton Statistics.

Editor Textile World:

Will you give me the cotton crop, in bales, for the season of 1897-98, of the United States, and the average price per pound for the same period?

N. J. J. H.

The cotton crop for the season of 1897-98 was, according to A. B. Shepperson, 11,215,953 bales; according to the New York Financial Chronicle, 11,180,960 bales; according to the New Orleans Cotton Exchange, 11,199,994 bales; according to the Department of Agriculture, 10,897,857 bales.

The average price per pound during the season, at the principal market of each State was, according to the Department of Agriculture, 5.71 cents; the New Orleans Cotton Exchange, 5.64 cents. This is below the average cost of production, according to A. B. Shepperson, who makes the cost in the interior Southern markets, 6 cents per pound, as necessary to cover the cost.

Quantity of Cotton Baled by the New System.

Editor Textile World:

How large, according to your estimate, will be the amount of bales put up this season by the American Cotton Com-

pany and the Planters' Compress Company? How are these new bales favored by the manufacturers of the United States?

Ill. G. D. W.

We have nothing that can be considered as authentic, upon which an estimate can be made, but we think we are safe in saying that less than two per cent. of the cotton crop will be baled by the American Cotton Company. We have heard 195,000 bales given. The Planters' Compress Company's bale will figure at a less amount, probably. Manufacturers differ greatly in their views regarding the merits of these two systems of baling cotton, and also differ as to the merits of the cylindrical form, as compared with the ordinary square form. The square bale is still regarded as the standard form, and it would be difficult to establish a departure from this, if planters would only put up their cotton as they should with better covering, and if railroads and other transportation companies would exercise more care in handling the bales confided to their care. There is a new square compressed bale with metallic covering which is favorably regarded by many. Prominent Rhode Island manufacturers are backing it, and it seems likely to cut quite a figure in the next crop. It is a 500 pound bale, square, and about one-third the size of the ordinary bale.

Editor Textile World:

We are much interested in your article on "Artificial Silk," in the March issue, and should like to know by whom the method of dissolving cotton by copper oxide of ammonia was invented. Do you know of any printed matter on the subject?

L. P. H.

The action of an ammoniacal solution of copper oxide, upon cotton, or the cellulose of vegetable matter, was discovered by Charles O'Neil, Manchester, England, in 1863, at the time he was pursuing his microscopical investigations of the action of chemicals upon vegetable fibres. Mr. O'Neil's discovery was long doubted, but was afterwards confirmed and settled by the microscopical investigations of John Butterworth, of Oldham, England, and publicly made known by the latter in 1883. If the April issue of the Textile World, page 51, were referred to, something might be learned on this subject.

Forms of Incorporation Under the New Jersey Law.

Editor Textile World:

Can you give me the form of certificate of incorporation of manufacturing establishments under the laws of New Jersey; also, the requirements in the statements that are made annually to the State officials?

Mass. G. W.

The certificate of incorporation requires the incorporators to declare their purpose of associating themselves under and by virtue of the provisions of the act of the State of New Jersey, entitled "An act concerning corporations (Revision of 1896)," and the several supplements thereto, and acts amendatory thereof, and also state that they severally will take the number of shares of capital stock subscribed to by them.

The certificate requires the name of the corporation; the location of the principal office in the State; the name of the agent therein and in charge thereof; upon whom processes against the corporation may be served; the objects for which the corporation is formed; the total authorized stock; the names and post office addresses of the incorporators, and the number of shares subscribed for by each;—the aggregate of such subscriptions being the amount of capital stock with which the company will commence business;—and the period of existence of the corporation. The certificate gives power to the corporation to conduct its business in all of its branches, have one or more offices, and to hold, purchase, mortgage and convey real and personal property outside of the State of New Jersey, and in all other States, and in all foreign countries. Other powers are granted to it, subject to agreement.

The annual statement, as we understand it, has to be rendered by the corporation to the State, according to the 43d section of an act entitled "An Act Concerning Corporations (Revision of 1896)." In this statement, the character of the business conducted, the principal office in the State, the name of the agent in charge of this office, the time of the election of directors, and their names, have to be given.

We might add, although the inquiry does not exactly cover this point, that the taxes and fees payable, on filing certificates relative to corporations, in the Department of State, are as follows:

Original certificates of organization and certificate of extension of corporate existence.

If capital stock authorized does not exceed $125,000..... $25.00

If capital stock exceeds $125,000, 20 cents for each $1,000 of the total amount of capital stock authorized.

Increase of capital stock.

If increase does not exceed $100,000 ..... $20.00

If exceeding $100,000, 20 cents for each $1,000 of the total increase authorized.

Consolidation and merger of companies.

Twenty cents for each $1,000 of capital authorized beyond the total authorized capital of the companies merged or consolidated; but in no case less than $20.00

Certificates of

dissolution, change of name, change of nature of business, amended certificates of organization (other than those authorizing increase of capital stock), decrease of capital stock, increase or decrease of par value or of number of shares $20.00

List of officers and directors $1.00

All other certificates $5.00

New Publications.

The Pearl of the Antilles. We have received from the author, F. M. Noa, of Geneva, N. Y., a copy of an interesting little book with the above title, which has a special value at this time when so much curiosity is felt concerning our new possessions. This book gives in a brief and concise form an abstract of the history and circumstances which led to the rebellion and subsequent interference on the part of the United States The general conditions prevailing in Cuba are briefly touched upon and the work will surely possess interest for any intelligent reader desirous of getting a concise history of Cuban affairs without the necessity of much reading. The price of the book, 75 cents, places it within reach of all. It is published by G. P. Putnam's Sons, New York, or may be had from the author on receipt of price.

Imports of Raw and Manufactured Silks. This is the title of statistical tabulations of the imports of raw and manufactured silks, and comparative view of silk imports from France, Germany, Switzerland, England, Japan and China, in the calendar year ending December 31, 1898, as compared with previous years. These statistics are published by the Silk Association of America, with headquarters at the Silk Exchange Building, Broadway and Broome Sts., New York. Those interested in these statistics no doubt can obtain a copy by addressing the secretary of the association.

The Art of Finishing. Published and presented to all finishers, by Birch Bros., Somerville, Mass. Price 20 cents. This is a pamphlet of 36 pages, relating to the art of finishing, illustrated with machinery made by Birch Bros. The pamphlet is well worth writing for, and we would suggest all finishers doing so.

Electricity in Town and Country Houses. By Percy E. Scrutton. New York: The MacMillan Company, 66 Fifth Ave. Price $1. This is a work of 148 pages, illustrated. It contains chapters on the following subjects: The Advantages of Electricity Compared with Other Forms of Energy; The Production of Electricity in Town Stations; The Production of Electricity by an Independent Plant; On Fitting the Interior of a House for the Use of Electricity; The Cost of Electricity.

Immedial Black V and G. This is the title of a recent color card issued by William J. Matheson & Co., New York, relating to a dye especially adapted for goods composed of cotton and silk.

Quarterly Journal of Economics. For April, 1899. Published for Harvard University, by George H. Ellis, Boston. This quarterly is edited by Prof. F. W. Taussig, with the following associates: C. F. Dunbar; William J. Ashley; Edward Cummings. This number contains articles on the following subjects: The Theory of Savers' Rent and Some of Its Applications; The Study of Practical Labor Problems in France; The Gas Supply of Boston; Can We Keep a Gold Currency?

Industrial News.

—San Antonio, Texas, desires and will take stock in a Cotton Factory, Woolen Mill, Leather Products or Cannery. Experienced and responsible parties (and no others) can get full information by writing the Business Men's Club of that city.

—The Berlin Iron Bridge Company of East Berlin, Conn., have taken the contract for the new roof on the East Armory of the Colt's Fire Arms Mfg. Co. at Hartford. This roof is 60 feet wide and 500 feet long, and is to be entirely recovered. The new roofing is to be the Berlin Iron Bridge Company's Patent Anti-Condensation Fireproof Roof Lining, consisting of anti-condensation lining underneath the corrugated iron, outside covering.

—The American Woolen Company's plants have been insured for $40,000,000, through a Providence, R. I., agency. This is the largest insurance ever placed.

—The Sexton & Robbin Company, Charlotte, N. C., have been appointed Southern agents for W. W. Altemus & Son, makers of textile machinery, 2816 North Front Street, Philadelphia. This firm is exceedingly busy, and has been for some time, having orders in hand considerably ahead, for the filling of which they are now running over time. Their business is much in excess of that of last year at this time.

—The Coventry Company, Anthony, R. I., and the Grosvenor Dale Company, No. Grosvenor Dale, Conn., have recently placed orders with the Howard & Bullough American Machine Company, Pawtucket, R. I., for revolving flat cards, in the first instance, and picking machinery in the second instance. The Hiawatha Manufacturing Company, Gibsonville, N. C., have also placed an order with the Howard & Bullough American Machine Company, for picking and card room machinery, as well as spinning frames. The Greenwoods Company, New Bedford, Conn., are making extensive alterations and additions in their picking plant, and have placed their or-

der with the Pawtucket works. The Granby Cotton Mills, Columbia, S. C., have just started up the picking machinery built for them by the same works.

—The annual meeting of the stockholders of the Joseph Dixon Crucible Company was held at the Company's main office, Jersey City, N. J., Monday, April 17, and out of a possible vote of 7345 shares, there were 7069 shares voted for the re-election of the old Board, consisting of Edward F. C. Young, John A. Walker, Daniel T. Hoag, Richard Butler, William Murray, Alexander T. McGill, and Joseph D. Bedle. President E. F. C. Young; Vice-Pres. and Treasurer John A. Walker; Secretary Geo. E. Long were re-elected by the Directors. Judge Joseph D. Bedle was also re-elected as counsel.

Refinishing and Sponging.

The American Woolen Finishing Works has recently been established at 164 High St., Boston, under the proprietorship of David Walsh, who is one of the best posted men in this line of business, having been 10 years as overseer of finishing in some of the best mills in this country. He has equipped his establishment with the best refinishing machinery, and is prepared to do anything in this line. He makes a specialty of cloth sponging by the so-called "London Shrunk" method, and also acts as an expert examiner and adjuster of claims. He has already secured a good share of patronage from some of the leading houses in the trade, and as there is a good field for a first-class establishment of this kind, he will doubtless meet with success, which his experience and ability justify.

The American Woolen Co.

The American Woolen Co., with a capital of $65,000,000, began business Tuesday. Officials and directors have already been announced. Only eight mills have been taken over, but the following mills will be acquired as soon as possible: Ray Woolen Mills, Franklin; Taft, Weeden & Co. Mills, Providence; Assabet Mills, Maynard; Sawyer Mills, Dover, N. H.; George E. Whitney Mills, Enfield, N. H.; Vassalboro Mill, Vassalboro, Me.; Kennebec Mill, Fairfield, Me.; Brown Manufacturing Co., Dover, Me.; Chase Mills, Webster; Faulkner Mills, Lowell; Collins Mill, Collinsville; Milner Mills, Moosup, Conn.; Sheffield Mills (John T. Fiske & Co.), Pascoag, R. I.; Manton Mills, Manton, R. I.; Inman Mills, Harrisville, R. I.; Lewis Anderson Co. Mills, Skowhegan, Me.

For Scouring, Bleaching and Mordanting.

Richman & Foley, 153 North Front Street, Philadelphia, are manufacturers of scouring salts, wool bleach and fast wool mordants. Their products are represented, by those who use them, as possessing the highest standard of excellence, due to their superior qualities. The scouring salts made by this concern are used for the reinforcement of soap, and take the place of alkalies, thus preventing all harshness of the goods, which is oftentimes produced when soda ash and sal soda are used. These salts tend to brighten the colors, and for scouring raw wool, are regarded by those using them, as possessing superior qualities, leaving the wool white, light and lofty. Their fast wool mordant is used in connection with chrome, imparting to the colors a lustrous shade, similar to that which is produced in France. The products made by this firm have established for themselves an enviable reputation in the New England States, as well as in Pennsylvania.

Buffalo Forge Co.'s Blowers.

The following letter dated April 6th speaks for itself:

Reed City, Mich., 4/6/99.

Buffalo Forge Company, Buffalo, N. Y.

Gentlemen: Acknowledging your favor of the 31st ulto., would say that we have equipped our foundry and blacksmith shop, and were very fortunate in getting blowers for our cupola and blacksmith forge.

We would not think of using anything but the Buffalo. It is the only blower we know of that will stand up and do its business. We have tried four other kinds, but have not been able to find any that will compare with your blower in any way whatever.

The National Iron Company.

Clutches.

Eastern Machinery Co., New Haven, Conn.

Gentlemen: Replying to your inquiry we are pleased to say that of six or seven different makes of friction clutches that we have used, yours has given the best satisfaction, and, in fact, is the only one that stands the constant hard use to which we subject them.

We have a considerable number of yours and they are in use every day reversing machines every few seconds, and doing in a day as much work as ordinarily done in a year when used on a lathe.

The superiority of yours for our hard use is such that for some years past we have applied them to all our new machines.

Malleable Iron Fittings Co.

Branford, Conn.

New Bedford Textile School.

It is expected that the New Bedford Textile School building will be roofed over some time during May. The new steam boiler has arrived and is being set in position.

Among the additional donations of machinery and supplies towards the equipment of the school since the last list was published by us, are a loom from Kilburn & Lincoln of Fall River, a complete humidifying equipment from the Drosophore Co. of Boston, Mass., supplies from the American Supply Co. of Providence, and others. Frederick Grinnell has made a handsome cash donation towards the funds of the school.

The Mason Machine Works, Taunton, Mass., will provide some machinery in addition to that formerly promised, and Stoddard, Haserick & Richards of Bos-

ton will supply two looms, making 16 in all besides hand looms. The contract for the hand looms has been placed, and it is now assured that the school will commence operation with an excellent cotton manufacturing plant. There is not only one complete set of machinery for converting cotton bales into cloth, but, in many cases, duplicates and triplicates so as to give students an opportunity of learning their trade on many of the leading makes of American machinery.

Inquiries for information as to the date of opening of the school, fees, etc., should be addressed to Managing Director C. P. Brooks of New Bedford, Mass.

Meyer's Spool Silks and Threads.

These goods are favorites in the trade, having been well tested in the past and stood the strictest examination as to strength and durability. They come on spools and cones, as may be desired. They are made in all sizes and in any colors to match the latest shades and tints of fabrics. Manufacturers who have not used these goods would make no mistake in placing a trial order with Messrs. John C. Meyer & Co., 87 Summer St., Boston, and we venture to say that they will not be disappointed. This firm also carries a special line of the ready wound bobbins to fit all styles and makes of sewing machines. Samples of their threads and silks will be furnished free of charge upon application, and prices quoted. One of the prettiest calendars of the season is issued by this firm, representing Mr. Meyer's little boy and girl, Miss Florence and Master Harold. This calendar will be sent if a two cent stamp is enclosed for postage.

Berlin Aniline Works.

Under date of May 1st, the Actien-Gesellschaft fuer Anilin Fabrikation issues a circular calling attention to the incorporation, under the laws of the state of New York, of a company under the style of the Berlin Aniline Works, through which they will sell direct to the American trade; their arrangement with the New York & Boston Dyewood Co., who had previously handled their products, having expired on the 30th of April. The main office will be located in New York at 72 Front St., and branch houses have been established at 124 Pearl St., Boston, and 207 South Front St., Philadelphia. C. Weidmann is president of the company, William T. Wisner, vice-president and treasurer, and O. Wigaart, secretary.

The Berlin Aniline Works will carry a full assortment of the Berlin Aniline colors, which are so widely and favorably known in this country. They are prepared to fill any orders for these goods with promptness. They have on the premises at New York, Boston and Philadelphia, finely equipped laboratories, where colors or samples submitted to them will be matched or desired tests made. Besides this line of colors, the works in Germany manufacture Nitrobenzole, Mirbane Oil, Aniline Oil and Salt of very superior quality, for which the American house would be pleased to furnish quotations on application.

The personnel of the establishment is well-known to the trade, and the goods have been extensively introduced and are in widespread use, so that the Berlin Aniline Works takes into its own hands a well established trade, which it will endeavor to satisfy and extend by continuing to please the present users of their colors and making new customers.

—Good families with weavers can find work at the Glen Woolen Co., West Fitchburg, Mass. Write before going.

—The Business Publishing Co., 32 Lafayette Place, New York City, has published a catalogue of books for business men. It is surprising the extent of literature that properly pertains to this head. A study of the large number of books indexed and briefly described is likely to suggest "long-felt" wants, existence of which may not have previously been felt. A copy of the catalogue may be had from the company for the asking.

—The Wright Health Underwear Co., of Troy, N. Y., formerly the Ætna Mill, is turning out heavy woolen goods for shipment to Dawson City and other points in the Klondike.

—The Murphy Manufacturing Co., Cohoes, are getting room ready for the cop yarn plant which they will install. It will not, however, be ready for production before the first of next year, as the company has had contracts made for this year's yarn supply. They will not make any more than enough for their own consumption. They are very busy with large orders on hand.

—The Commercial Knitting Mills of Troy will remove their latch needle plant to the Enterprise Mill in Cohoes, which they recently purchased. They will continue the flat goods department at Troy. This concern recently purchased the machinery from the Lape & Dunlap Mill at Valley Falls, N. Y., at assignee's sale.

April Sales of Mill Shares.

	Lowest.	Highest
Wamsutta	105⅝	105⅞
Border City	125¼	126⅛
Lyman	69	70
Lowell Bleachery	80	82½
Naumkeag	66¾	70
Chicopee	92½	95½
Lawrence	125½	126½
Amory	125½	130½
Tremont & Suffolk	140	140
Cabot	53	55
Lancaster	448	450
Middlesex	117½	117½
Laconia	642½	650
Nashua	605	605
Amoskeag	1785	1800
Hill	40	40
Hamilton Woolen	51	51
Hargraves	102½	102½
Laurel	100	100
Pocasset	107	107
Union	170	170
Boott	820	820
Merrimack	1155	1155
Jackson	962½	962½
Dwight	855	855
Lowell	542½	542½
Merchants	76	76
Sagamore	104	104
Weetamoe	60	60
Atlantic	60	60½
Franklin	104	104
Androscoggin	115	115
Edwards	175	176
Pepperell	1470	1470
Everett	80½	80½
Hamilton	762½	762½
Stark	1100	1100

The Mulhouse Society's Medal.

Messrs Wm. Pickhardt & Kuttroff beg to announce that the medal offered as a prize by The Industrial Society of Mulhouse, Alsace, for the introduction into commerce of Indigo obtained by synthesis, at a price permitting its competition, in all the applications, with Indigo made from plants, has been awarded to the Badische Anilin & Soda Fabrik with the comment, "The Industrial Society rarely had the opportunity to award a prize which has been so fully merited and seldom have the conditions for a prize been so completely met."

—The United Waste Co. has purchased from Charles McCarthy the mill formerly known as the American Mill, at Cohoes. It will at once be put in readiness to receive machinery for the manufacture of cotton bats and shoddy, and started up as soon as possible. Among the people interested in this enterprise are Ex-Governor R. P. Flower, Ex-Senator Edward Murphy, and his sons Edward Murphy, Jr. and Joseph Murphy, Ex-Mayor Hugh J. Grant, Anthony Brady, Charles Kavanaugh and James H. Shine. The company has several other plants under consideration, which may be purchased later and turned into shoddy mills.

Steel Caps and Spindles.

Bamford & Smith, of Pascoag, R. I., manufacturers of the Bamford dust-proof and self-lubricating spindle tube, which has been so extensively introduced in worsted spinning, have added to their business the manufacture of steel caps and spindles, which is closely related to their former business and will give them a larger and more complete line in that department. This firm has met with excellent success in the introduction of its improved spindle tube, and this is a natural expansion of their business, which will doubtless be attended with similar success.

MILL NEWS.

Cotton.

New Mills.

—*Alabama, Mobile. The foundation for the new Mobile Cotton Mills has been laid, and work is progressing as rapidly as possible. Fifteen cottages have also been erected for the use of employees.

—*Alabama, Talladega. The new cotton mill which we recently mentioned was being organized here will be known as the Highland City Mills. F. H. Hicks will be president. Cecil Browne is also interested. It is said that a plant of 5000 spindles for producing yarns will be installed. The company desires to receive estimates on such an equipment.

—*Georgia, Douglasville. It is said that the Great Western Cotton Mills will soon be in operation, Col. Jos. S. James, president of the company, having secured the amount of money necessary. The equipment will be 20,000 spindles, 500 looms; steam power, and they will manufacture sheeting, duck and drills.

—*Georgia, West Point. The new mill which will be built by the Lanett Cotton Mills will have an equipment of 30,000 spindles and 800 looms; steam power. About 700 hands will be employed on sheetings, drills, sateens and ducks. The foundation for this building will be started about the 10th of May, and it is hoped to begin production February 1, 1900. This addition will give to the Lanett Mills a total equipment of 56,000 spindles and 1500 looms.

—*Indiana, New Albany. D. F. Bowman informs us that he will manufacture cotton and woolen waste for railroad use. The new building which he is erecting, is 35 by 110 feet, two stories high, and he hopes to have it completed in sixty days, when he will operate five waste machines.

—*Louisiana, Shreveport. At a recent meeting of the stockholders of the proposed cotton factory here, it was decided to entitle it the Hargrove Mill. The capital stock was fixed at $100,000, and all of the shares have been taken. The following officers were elected: Jules Dreyfuss, president; Leon M. Carter, first vice president; H. H. Hargrove, second vice president; John W. Taber, secretary.

—*Maryland, Ashland. The proposed mill for this place will be known as the Ashland Cotton Manufacturing Co. Capital stock is $100,000, and the incorporators are Messrs. Summerfield Baldwin, Joshua Horner, Emmanuel Herman, J. F. C. Talbott, Joshua F. Cockey, Jr., H. F. Bartleson, Pietro Palagano, Philip E. Frantz and Dr Benjamin R. Benson.

—Massachusetts, Adams. The directors of the Berkshire Cotton Co. have decided to add to their plant a mill which will cost in the neighborhood of $1,500,000. Plans are now being drawn, and as soon as the details are settled, full particulars will be found in these columns. The new mill will probably have 100,000 spindles.

—*Mississippi, Jackson. The cotton mill which we reported recently would be established here, to be owned and operated by colored individuals, has applied for a charter. The capital will be $250,000. The company will be known as the Mississippi Cotton Mfg. Co. Hon. James Hill is the prime mover.

—*New Hampshire, Manchester. The new mill which the Amoskeag Manufacturing Company will build this summer to take the place of the present Nos. 4 and 5 mills, will be 500 by 100 ft., five stories high, with a picker house 100 by 150 ft. The new mill will be complete in itself, as it will be fitted for carding, spinning and weaving. No. 4 mill is being rapidly torn down, but No. 5 mill is still in operation, and will be kept running until the new mill is almost completed. Large water wheels will be installed,

which will result in the building of a new pen stock. The new mill will be built by the corporation itself and everything will be pushed as fast as circumstances will permit.

—*North Carolina, Fayetteville. John R. Tolar, J. H. Hart and Walter L. Holt have purchased the McIntyre property here, consisting of 193 acres adjoining the Holt-Morgan Mills, on which it is said they will proceed at once to erect a 10,000 spindle mill in the manufacture of soft yarn.

—*North Carolina, Jerusalem. In reference to the cotton mill proposed by B. Frank Mebane of Greensboro, N. C., and others, which we have previously reported under Mocksville, it is said that it will be located near this place. It will be known as the Cooleemee Cotton Mills, and may have an equipment of about 25,000 spindles.

—North Carolina, Lexington. A cotton mill company is being organized here for the establishment of a 10,000 spindle cotton mill, in which the following are interested: George W. Montgomery, W. G. Perry, C. A. Hunt, J. F. Hargrave and others.

—*North Carolina, Raleigh. The new mill in which Ed. Chambers Smith is interested here, is capitalized at $250,000, although the company has not yet been organized. They hope to start on the foundations in May, and have it in full running order next January, employing about 400 hands, on colored dress goods, etc. This, however, largely depends upon whether the necessary capital can be raised.

—*North Carolina, Roxboro. It is hoped to build the Roxboro Cotton Mills during this summer, so as to have the mills ready for work in time for the next cotton crop. The mills will be for spinning only, and will operate from 3000 to 5000 spindles. The company is not organized yet. It will be capitalized later at from $50,000 to $70,000. Mr. J. A. Long is the principal figure in this project.

—*Rhode Island, Warren. The contract for building the new Parker Mill has been awarded to Beattie & Wilcox of Fall River. The building will be a three-story brick structure, 280 by 148 feet, with two ells, one for the engine room and the other for the picker room. The capacity of the new mill will be about 30,000 spindles. Work on the foundation has already commenced. Fales & Jenkes spinning and Kilburn-Lincoln looms will be installed.

Enlargements and Improvements.

—Alabama, Eufala. A project is being considered for the doubling of the capacity of the Eufala Cotton Mills, which at present operate 10,480 spindles and 321 looms. John W. Tullis is president of the company.

—Alabama, Selma. The Cawthorn Cotton Mill has given a contract for new machinery, to cost about $20,000, and it is reported that many other improvements will be made, among which is the building of warehouses, etc.

—Arkansas, Little Rock. The Thomas Cotton Mills, which commenced operations last fall on commercial wrapping twine, carpet warp, etc., may be enlarged very soon. At present they operate 3000 spindles.

—Georgia, Atlanta. The Fulton Bag & Cotton Mills will increase their plant by the addition of 500 Northrop looms.

—*Georgia, Atlanta. The Exposition Cotton Mills inform us that the addition which we recently reported would be built by them, will be 65 by 150 feet, in which will be installed 4500 spindles and 150 looms, giving employment to about 50 hands on cotton sheetings and drills.

—*Georgia, Athens. The Mallison Braided Cord Company inform us that they will not build an addition, but are installing an amount of new machinery for the purpose of manufacturing yarn for their own use. They are putting in 10 cards and 500 spindles.

—*Georgia, Griffin. It is reported that work will begin next week on the addition which we recently reported would be made to the Kincaid Manufacturing Company's mill.

—*Georgia, Lindale. The addition to the Massachusetts Mills in Georgia, at this place, has been completed, and a portion of the machinery has been installed. It is hoped to have all of the machinery in place, including 300 looms, by May 1.

—*Georgia, Macon. The addition which we recently reported would be built to the Willingham Manufacturing Company's mill is now in course of erection.

—*Georgia, Marietta. The Marietta Paper Manufacturing Company's mill, which we reported last week had been leased by the Riverside Mills, of Augusta, will be known as the Marietta Branch of the Riverside Mills of Augusta. Cotton batting only will be manufactured here. C. P. Gwin is resident agent.

—Maine, Auburn. At a recent meeting of the stockholders of the Barker Mill, the directors were authorized to improve the carding plant, the work to commence at once, cost not to exceed $35,000. The old cards will be removed, and modern cards put in. Also some minor improvements in the cloth room. They expect to sell their goods in the brown in future.

—Maine, Saco. It is said that the York Mfg. Co., who are now operating 1600 looms, will have a total of 2200 running before fall. They are also to put in more spinnig frames to take care of the weaving.

—*Massachusetts, Fall River. It is said that the Stevens Mills will increas their capital stock about $100,000, and will expend $150,000 on the improvements which we recently mentioned would be made to this plant.

—*Massachusetts, Fall River. The one-story addition, which we recently reported would be built by the Sanford Spinning Company, is now in process of erection. This will be used for cone winding.

—*Massachusetts, Fall River. The addition which has been built to the Hargraves Mill No. 3, has been fitted up with looms, and is now in operation.

—Massachusetts, Fisherville. The Fisher Manufacturing Company has added to its loom equipment.

—Massachusetts, New Bedford. The Bennett Spinning Company are about

to erect a weave shed, in which will be installed about 600 looms. Should this venture warrant, it is understood that the weaving capacity may be increased until the Bennett Mill becomes a regular cloth mill, using its own yarn product.

—Massachusetts, New Bedford. The Hathaway Manufacturing Company and the Acushnet Mills are both said to be about to build weave shops, in each of which will be installed about 700 looms.

—Massachusetts, Whitinsville. It is reported that a number of improvements are about to be made to the Whitinsville Cotton Mills. These improvements will consist of the removal of the mules, which will be replaced by 29 spinning frames and 76 looms, and it is also said that the 18 looms now being operated in the lower weave room will be taken out and new ones installed in their place.

—Massachusetts, Williamstown. The Williamstown Manufacturing Co., which has recently gone more extensively into fancy goods, is putting in a number of twisters and other machinery to balance their plant for this product.

—*New Hampshire, Nashua. The new weaving mill, which is being built by the Nashua Manufacturing Company, is almost completed, and it is hoped to have it ready for production by July. The building has been erected, the floors have been put in, and a great deal of the heating and power apparatus has been placed.

—*North Carolina, Edenton. The Edenton Cotton Mills are now about to award contracts for the building of the additions which we recently reported would be made to their plant.

—North Carolina, Greensboro. It is said that a new building will be erected by the Hucomuga Mills to be used for carding and spinning. L. W. Buck is secretary and treasurer of this concern.

—North Carolina, Raleigh. The Raleigh Cotton Mills have added 2700 additional spindles to their present plant.

—North Carolina, Rutherfordton. We hear that the Levi Cotton Mills, which started up last February, are considering the addition of a 4200 spindle equipment.

—North Carolina, Spray. The Spray Cotton Mills are extending their buildings, to enable them to install 6,000 additional spindles and preparatory machinery.

—*Virginia, Lynchburg. At a meeting of the stockholders of the Lynchburg Cotton Mills, the directors were given power to erect an addition, which has been contemplated for some time. It is said that a new engine room and boiler house will be built with an increased capacity of 800 h. p. in addition to the large mill. Plans for the foundation are expected to be completed within two weeks and ground will be broken as soon as the contract is let. The equipment will probably be about 22,000 spindles and 726 looms. The floor capacity will be about 163,416 square feet. It is thought that the new mill will cost in the neighborhood of $400,000.

Mills Starting Up.

—*Delaware, Wilmington. The plant of the Arlington Mills Manufacturing Company has been purchased by parties representing Woodward, Baldwin & Company, of Baltimore, Md., for $100,000. It is probable that Woodward, Baldwin & Company will improve and renovate the mill and start it up once more.

—*Maryland, Millington. The Unicorn Mills, which have been idle for a number of years, have started up on the manufacture of toweling, napkin material and coarse goods.

—*Massachusetts, Braintree. The new concern for the manufacture of medicated and absorbent cotton, known as the John C. Trott Company, is almost ready for business. This was formerly the firm of Clapp & Trott, Dedham, Mass. Their principal product will be sterilized cotton, absorbent cotton, and gauze for hospital supplies.

—*Rhode Island, Hope Valley. The Locustville Cotton Mills, owned by the Nichols & Langworthy Machine Co., have started up again after a long shutdown.

—*South Carolina, Charleston. The company which will operate the Charleston Cotton Mills by negro labor has been incorporated with a capital stock of $250,000. They will now be known as the Vesta Cotton Mills. The incorporators are J. H. Montgomery of Spartanburg, S. M. Milliken of New York, W. M. Bird of Charleston, L. G. Potter of Spartanburg and A. T. Smythe of Charleston. J. H. Montgomery is the president of the company and L. G. Potter secretary and treasurer.

—*South Carolina, Waterboro. The Colleton Cotton Mills have commenced operations. The capacity of the mill is 5000 spindles. President, A. C. Schaffer. The product is yard-wide home-spun.

—*Texas, Sherman. There is a probability that the cotton mill formerly operated by the Sherman Bag Co. will be started up. W. C. Howard, of Dallas, president of the Dallas Cotton Mills, and his associates, have purchased the property and will overhaul it and start it in the near future. New tenements will be built.

Woolen.

New Mills.

—Alabama, Anniston. The Anniston Carpet Co. has been organized here with a capital stock of $50,000 to manufacture ingrain carpets. It is hoped to have the plant in operation by June 1. 60 to 70 operatives will be employed, and the output will be about 1500 yards a day. The organization was effected by William H. Zinn, of the Anniston Cordage Co. The plant will be located on the corner of Mulberry and Eleventh Sts., and work on the buildings has already commenced. A dye house will also be built.

—Massachusetts, Lawrence. G. E. Kunhardt may soon erect a new mill four stories high to cost about $60,000. The structure will be of brick.

—*Massachusetts, Shirley. The Fred D. Weeks Extracting Co. has started to erect another building to replace the one recently destroyed by fire. They hope to have the plant in operation by May 15, on custom carbonizing, picking and wool extracts. Steam and water power, dye house.

—Pennsylvania, Philadelphia. The mill, on 4th and Cumberland Streets, formerly operated by J. P. Murphy & Company, Ltd., has been leased by a new company, known as the Fern Rock Woolen Mills Company, who will operate 32 broad looms, on cassimeres and dress goods. P. L. Clay has been appointed superintendent.

—*Rhode Island, Woonsocket. The city council has granted Simones & LePoutre exemption from taxes, and a four-story brick mill, 110 by 180 feet, with a capacity of 17,000 spindles, will be erected. C. R. Makepeace will draw the plans. The plant is for fine French spun worsted yarns. The plans will provide for double the initial capacity. Chas. Loridans represents the foreign owners. The plant must be completed 10 months to get exemption.

—*Washington, Spokane. The Spokane Textile Manufacturing Co. inform us that they will start on the foundations of their mill about April 15, and that they hope to be manufacturing in about three months. They will operate one set and nine looms on blankets, flannels and yarns: electric power; dyehouse. Their factory will be at S. 515 Bernard St.

—Wisconsin, Fountain City. The Coley Carpet & Rug Company have started up here on the manufacture of patent reversible Brussels and Wilton rugs. The officers are: Albert Kirchner, president; J. P. Reinhardt, vice-president; C. A. Kirchner, secretary and treasurer; James Coley, manager. Harry Coley, of Worcester, Mass., will also be connected with this firm.

Enlargements and Improvements.

—Massachusetts, Hampden. The machinery in the Hampden Mills is being changed for the purpose of weaving worsted fabrics.

—Massachusetts, Lawrence. L. Sjostrom & Son, of the Lawrence Dye Works, have leased the Massachusetts Bleach & Dye Works at North Andover Depot, formerly of A. Kuhnert, and will operate them in connection with their present establishment.

—Massachusetts, Methuen. The Knitted Fabrics Co. are about to build a dye house, 42 by 114 feet, two stories high.

—Massachusetts, North Adams. Strong, Hewatt & Co. have installed an amount of new machinery, and a wool scouring plant has also been added.

—Virginia, Buena Vista. Contracts have been awarded by the Buena Vista Cassimere Mills, for the erection of an addition, in which, when completed, new machinery will be installed.

Mills Starting Up.

—California, San Jose. The San Jose Woolen Mill, which has been closed over five months, started up again April 1.

—Connecticut, Montville. The Montville Woolen Co.'s plant is now in full operation, after an idleness of several months.

—Connecticut, Wilsonville. The woolen mill at this place operated by Lawrence Keegan is in full operation after a long period of idleness.

—Maine, Alfred. It is reported that C. W. Springfield's woolen mill, which has been closed for some time, will resume operations very soon.

—Massachusetts, Millbury. Fred A. Lapham has leased the Atlanta Mills again, with the intention of starting them up at once. These mills have been shut down since the expiration of his former lease, in 1895.

—Massachusetts, Pittsfield. The Pittsfield Manufacturing Company, whose factory has been partially closed for a considerable time, has started the mill up again on nearly full time.

—Massachusetts, Worcester. John R. Scott, of Uxbridge, has leased the Piedmont Mill of the Hopeville Manufacturing Co. He will operate three sets and forty looms on satinets.

—New Hampshire, Hinsdale. The Haile & Frost Mfg. Co. have started up their mill, which has been idle for several months.

—New York, Jamestown. The Jamestown Woolen Mills have started up, after a shut-down of about nine months.

—Pennsylvania, Philadelphia. The Pequea Mills, owned by William Wood & Company, 22d and Spring Garden Streets, have started up in full, after a long period of slack time.

—Pennsylvania, Norristown. It is reported that Beatty & Company, manufacturers of art squares, whose plant has been idle for a considerable time, will commence operations very soon. John Greer is said to be financially interested in the concern.

—Rhode Island, Washington. The yarn mill at this place operated by Benjamin Moon, which has been idle for several years, is about to resume operations.

—Rhode Island, Wickford. The Wickford Woolen Mills, owned and operated by William Gregory, which have been running on short time for several months, have resumed operations on full time.

—*Tennessee, Mossy Creek. The Mossy Creek Woolen Mills have been sold to Ralph Mountcastle of Knoxville, Tenn., a member of the firm of Daniel Briscoe, Bros. & Co., dealers in dry goods and notions. Mr. Mountcastle is said to be organizing a new company to operate the mill, with a capital of $30,000. The present equipment is one set, 28 looms; steam power, dyeing and finishing plant. Mr. Mountcastle will probably largely increase the plant.

Mills Shutting Down.

—*Massachusetts, Conway. The Conway Woolen Mills, owned by the Delebarre Estate, and which were recently purchased by John Fothergill & Company, are once more closed down, the latter firm having been attached.

—Massachusetts, Holliston. There is a report from this place to the effect that the Holliston Yarn Company has decided to go out of business. The company is controlled by E. M. Rockwell.

—New York, Brooklyn. G. L. Kelty & Co., 475 Keap St., manufacturers of upholstery goods and blankets, have closed down for the present.

—Rhode Island, Westerly. We understand that the firm of Campbell, Henault & Co. are going to give up their lease of the mill at this place, which they have operated for the past four years. It is understood that the plant and machinery are in rather poor condition, and as neither the owners nor the mortgagees seem disposed to make the desired repairs, the firm will probably remove elsewhere. There has been some talk of their taking the mill at East Greenwich.

Knit.

New Mills.

—Florida, Jacksonville. A. J. Bigelow is reported as about to establish an underwear knitting mill here, equipment for which has been ordered.

—Georgia, Palmetto. H. S. Johnston is reported as being desirous of receiving estimates on knitting machinery, having in mind the establishment of a mill here.

—*Iowa, Des Moines. The Iowa Knitting Co. has been incorporated with a capital of $25,000. The following are the incorporators: Milo Ward, E. C. Musgrave, W. E. Musgrave, W. H. Kehrer and F. W. Paschal. We have given particulars about this mill.

—*Massachusetts, Pittsfield. The amount desired by the Musgrove Brothers before they would agree to establish their proposed knitting mill, has been subscribed, and the new industry will probably start up very soon. They will manufacture ribbed underwear, employing about 30 hands at the outset, and probably increasing later. They will locate on West St. in the Noble block. Most of the machinery has been ordered.

—New York, Brooklyn. The Blumenthal-Saxonia Knitting Mills is a new concern which has started up here at 123-125 Middlesex Ave., on the manufacture of knit goods.

—North Carolina, Laurinburg. Thomas J Gill is said to be requesting prices on a knitting mill plant with the intention of establishng one here.

—Ontario, Glen Tay. J. B. Molleur of St. John is said to have purchased the Glen Tay Woolen Mill, and it is announced that he will establish a four-set mill in that town, to run on medium and fine underwear.

Enlargements and Improvements.

—Georgia, Hampton. It is reported that an addition has been built to the Henderson Knitting Mill. This enterprise is a new concern which started operations last July on ladies' underwear.

—*Georgia, Rossville. The Richmond Hosiery Mills inform us that they will add about 30 new knitting machines, bringing their total number up to 225. These, we believe, have been already contracted for.

—*Michigan, Grand Rapids. The improvements which we recently reported would be made to the Star Knitting Mills include an addition of three stories to the factory, enlargement of the office, new power apparatus and installation of a new boiler and a numebr of knitting machines.

—Minnesota, Mankato. It is said that some extensive improvements have been made at the Mankato Knitting Mills, which will result in a more diversified product. A plant for dyeing fast black cotton hosiery has been installed and put in operation, and machinery for making mittens, having a capacity of 300 dozen daily, has also been placed. The mills at present are employing about 130 hands.

—New York, Cohoes. The Parsons Mill is said to be adding machines which will enable it to produce flat and fleece-lined goods.

—New York, Cohoes. It is reported that the machinery of the Empire Knitting Mill is being changed and added to for the purpose of manufacturing fleece-lined underwear.

—New York, Cohoes. The Star Knitting Co. have put in a new Hunt-McCormick 150 H. P. turbine wheel.

—New York, Cohoes. The Commercial Knitting Mills Co., of Troy, N. Y., have purchased the Enterprise Mill at this place, in which they intend to put new machinery and run it in connection with their mill at Troy.

—New York, Oriskany Falls. The Oriskany Falls Knitting Co. is reported as having purchased the Oriskany yarn spinning plant, consisting of three sets, which will be renovated for immediate operation.

—New York. Hoosick Falls. Clark Bros. & Company, proprietors of the Superior Knitting Mills, have dissolved partnership. Francis Riley, who comprised the Company, has retired. Mr. Riley's interest has been purchased by the Seamless Hosiery Company, of New York, of which C. E. Bruce is president. The company has been reorganized, and George Clark will be the manager of the new concern.

—*New York. Waterloo. The parties who co-operated with Joseph Howarth, in purchasing the Waterloo Knitting Mills, are reported as having begun the construction of new buildings and the repair of the old ones, preparatory to starting up the plant.

—*North Carolina, Burlington. The Daisy Hosiery Mills inform us that they have not fully decided as to what their improvements will consist of, but they will probably add about twenty machines very soon. They operate solely on seamless hosiery. They inquire about electric lighting apparatus.

—*Pennsylvania, Allentown. The Southdown Knitting Mill Co., which was recently re-organized with a capital of $25,000, is removing to its new quarters in the Yeager Building in South Allentown.

Silk.

New Mills.

—Connecticut, Middletown. The L. D. Brown & Son Co. have purchased land and will build thereon a mill for the weaving of dress silks and linings, which new addition will be about 230 by 60 feet. It will probably cause employment for 125 to 150 additional hands.

—*Delaware, Dover. The Dover Hosiery Mill has been finally rented to Post & Sheldon of Paterson, N. J. The factory will be used as a branch of the Paterson firm and will be used for broad silk weaving.

—Massachusetts, Milford. The Magid-Hope Silk Manufacturing Company are reported as having purchased the factory buildings here, which were formerly occupied by the Colburn-Fuller Company. They will install a plant for the purpose of treating waste silk by a new process. The property consists of 22,000 square feet of land, and a building containing 60,000 square feet of floor space. This company has talked of locating at Woonsocket, also at Peabody and other places. Boston office is 85 Water St.

—New Jersey, Jersey City Heights. Stohne & Mincke are operating 12 looms, at 162-164 Congress Street, on button cloths and vest materials.

—*New Jersey, Plainfield. The Watchung Silk Co. has been unable to start up, owing to the poor condition of the machinery which they purchased second-hand. The enterprise has languished since the withdrawal of Messrs. Bullock & Young. It has at length been determined to renovate the machinery, and it is hoped to have the mill in operation inside of two months.

—New Jersey, Ridgewood. We understand that a new mill will soon start in this place to be known as the Equitable Silk Mill.

—New York, Brooklyn. Adolph Pass is manufacturing silk ribbons at 171-187 Wallabout Street.

—Pennsylvania, Bellefonte. David Salmon, of Lock Haven, and M. B. Ritter, of Williamsport, recently visited this place in the interest of a silk mill for which they are looking up a location, and seem favorably impressed with the advantages of Bellefonte.

—Pennsylvania, Williamstown. A contract has been awarded to Bennett & Rothrock for the erection of an addition to the Lycoming Silk Mill. The building will be of brick, 45 by 200 feet, and four stories in height. Work will be commenced at once, and it is expected that the building will be completed inside of four months. It is said that this will result in the employment of between 300 and 400 new hands.

—*Virginia, Norfolk. Estimates are being asked for the erection of the one-story addition, together with boiler and engine house, 236 by 200 ft., which we recently reported would be built by the Norfolk Silk Company.

Miscellaneous.

New Mills.

—Massachusets, Methuen. A napping mill is being erected here by Edward Whittaker on Centre St.

—*Massachusets, Millbury. The hammock factory which we recently reported was being started at this place, in which Hovey E. Sweet is interested, is known as the Comfort Hammock Co., post office address, Box 86, Worcester, Mass. They operate five looms, by steam power on all kinds of woven cotton hammocks. The interested parties are George M. Bancroft and Hovey E. Sweet. They sell direct.

—*Massachusetts, Woburn. In March we reported the incorporation of the American Linen Fibre Co. under New Jersey laws. We now learn that they will establish works at a suburb of Woburn called Mishawam. The Boston office is 53 State St. Perley Putnam, president of the Eastman Heater Car Co., is president; John L. Cunningham, of the Cunningham Lumber Co., Boston, is secretary and treasurer. We understand that A. F. Knight, a well-known cotton mill man, and J. A. Burleigh, formerly connected with the Providence Knitting Machine Co., are also interested. The company has been experimenting at the plant of the Reynolds Woolen Mill at Davisville, R. I., with satisfactory results. They will manufacture flax tow waste into absorbent linen stock and other specialities, and in connection with the works, will establish a bleachery and dye plant.

—*New Jersey, Paterson. The Bagdad Rug Company inform us that they do not know when they will be able to start up. The company has been incorporated with a capital of $25,000, with the following officers: Jacob Cazelins, president; Otto Jaeger, treasurer; Wm. H. Fletcher, superintendent.

—*New York, Lockport. The linen mill which we reported last week as being established here has been incorporated as the Niagara Linen Co., with a capital of $50,000. The officers are president, Chas. A. Hoag; vice-president, W. A. Williams; and secretary and treasurer, W. T. Ranson. A two-story stone mill has been purchased and will be put in operation as soon as it can be fitted with the necessary machinery.

—Rhode Island, Valley Falls. The Frank Woods Manufacturing Company has started up a plant of 10 looms here on dress trimmings, etc.

Enlargements and Improvements.

—Massachusetts, Millbury. The Union Linen Co. is about to build a new bleachery thirty feet square. It has 1 set and 16 looms running.

—New York, Auburn. Additions will be made to the plant of the Columbia Cordage Company, which will double its capacity. An additional story will be built to the spinning room, 90 by 39 feet, and another to the preparing room, 60 by 96 feet. A new engine house will be erected, 72 by 50 feet, and a boiler house, 80 by 56 feet. The rope and twine department will be increased by making excavations under the entire main building. Plans have also been made for two fire-proof brick warehouses, 75 by 100 feet, which will be built this season, if the work can be accomplished.

—Pennsylvania, Eddystone. It is rumored that the Eddystone Mfg. Co. are contemplating some extensive improvements to their plant, one item of which will be an annex to be added to the dye house and storage department.

—West Virginia, Wheeling. It is announced that J. L. Stifel & Sons, calico printers, will construct, this spring, a building, to which the works now located at Ninth and Main Streets will be moved. The building will be 150 by 200 feet, three stories high, and will be built of brick, with stone facings. It is estimated that the cost of this new building will be in the neighborhood of $50,000.

Fires.

—Chicago, Illinois. A fire destroyed the Armour Curled Hair & Felt Works here on March 27th, causing a loss of nearly $400,000. Three bodies have been recovered from the ruins, and it is thought that there are others still to be found. The building which was destroyed was the one which was built to replace the works burned out only a year ago. It was a five-story structure, 112 by 225 ft., and was completed last August. An insurance was carried on the property for $300,000. It is reported that the works will be rebuilt at once.

—New York, Albany. The shoddy mills of Frank B. Graves, at 14 Bleeker Street, were recently damaged by fire to the amount of $10,000. The building is owned by C. D. Lansing, and is said to be fully insured. The amount of Mr. Graves' insurance is not known.

—New York, Lockport. A fire in the Lockport Cotton Batting Co.'s mill, owned by E. W. Rogers & Son, caused damage recently to the amount of between $1500 and $2000, partially covered by insurance. The fire is thought to have originated in a carding machine.

—North Carolina ,Salisbury. The Salisbury Hosiery Mills were recently destroyed by fire. They were insured for $10,000.

—Pennsylvania, Philadelphia. The Times Finishing Works, owned by Samuel Lea & Sons, on American and Bodine Sts., were damaged by fire recently to the amount of $12,000, fully covered by insurance.

—Pennsylvania, Philadelphia. The Kensington Dye Works, owned by T. Brophy's Sons, at Jasper and Clearfield Sts., were damaged to the amount of $5000 by fire recently; fully covered by insurance.

Failures and Suspensions.

—Connecticut, Dayville. Carl Stahl has been appointed receiver of the Youkon Woolen Co.. Jas. Legg, agent, and has taken charge of the plant. The liabilities were $82,500 and assets $15,000.

—*New York, Schaghticoke. C. E. Greenman, assignee of the Schaghticoke Woolen Co., owned by S. W. Barker, has been ordered by the courts to pay preferred creditors, help and persons holding liens, etc., in full, and to pay a dividend of 18 per cent. on all other claims, which will amount to a total of about $93,000.

—Ontario, Simcoe. Harding & Son, shoddy manufacturers, have assigned to C. S. Scott of Hamilton, Ont.

—Pennsylvania, Reading. The knitting mill known as the Urania Hosiery Company (not incorporated), operated by George Steinhauer, has been closed on an execution for $1071.

Facts and Gossip.

—California, Los Angeles. I. D. Jackson, of Connersville, Ind., is talking of starting a carpet factory at this place.

—California, Marysville. Efforts are being made looking toward the rebuilding of the Marysville Woolen Mills, which were burned in March. It is probable that the former proprietors, who are advanced in years and wish to retire from active business, will not take the management of the plant again, but it is expected that the mill will be rebuilt at an early date when the plans are settled.

—Connecticut, Meriden. The Westfield Manufacturing Co. will move here from Westfield, and will be known as the Meriden Thread Co. The company will be incorporated with a capital of $50,000, a portion of which has been taken by the Meriden people. They will probably employ about 50 hands at the outset.

—Connecticut, Old Lyme. The Lyme Woolen Company has been incorporated with a capital of $2500, of which sum $2000 is paid in, for the purpose of manufacturing yarns, etc. The incorporators are: George Fark, James Bradbury, and John H. Bradbury, all of Old Lyme.

—Connecticut, Oneco. It is reported that the Oneco Manufacturing Company, whose factory was destroyed by fire on March 2, will not rebuild and may go out of business.

—Connecticut, Willimantic. The Ruddy Thread Co.'s plant is being removed from Worcester to the No. 4 mill of the American Thread Co. here. This is one of the four plants which are to be transferred to Willimantic by the trust.

—*Connecticut, Willimantic. The Windham Cotton Mfg. Co.'s plant will be sold May 17 to satisfy the mortgages amounting to about $75,000, held by the Rhode Island Hospital Trust Co.

—Georgia, West Point. The Galeton Cotton Mills have been renamed the Riverdale Cotton Mills, and it is said that extensive improvements will be made to the plant. The erection of an additional building at a cost of $20,000 is talked of.

—Indiana, Muncie. The Muncie Underwear Co. has been incorporated at Ridgewood, N. J., with a capital of $100,000, to manufacture cotton and woolen goods. The incorporators are Alpin J. Cameron and William E. Maltbie of Ridgewood, and William P. Denegre of Philadelphia. This is an incorporation of the former business.

—*Maine, Dexter. The firm of Amos Abbott & Co. has been incorporated with a capital stock of $250,000. The officers are: Job Abbott, president; A. P. Abbott, treasurer, and G. Walter Abbott, secretary. The stock is all held in the Abbott family.

—Maine, Westbrook. The Bates Manufacturing Company of Lewiston, is the latest rumored party said to be contemplating the purchase of the Westbrook Manufacturing Company's mills. These latter mills have been shut down since July 1st, 1896.

—Massachusetts, Boston. David Welsh has started a refinishing plant at 164 High St. An examining, cloth shrinking and sponging department will also be run in connection with the finishing.

—Massachusetts, Lowell. The American Woolen Co. took possession of the Faulkner Mills on May 1st.

PERSONAL RECORD.

Cotton.

—S. M. Green, for 10 years master mechanic at the Merrick Thread Mills, Holyoke, Mass., has been promoted to be master mechanic for the entire 21 mills of the American Thread Co.

—Henry Greenwood, overseer of the winding and quilling department of the Lancaster Mills, Clinton, Mass., has resigned.

—John Freeman, of Indian Head Cotton Mills, Cordova, Ala., is now employed by the Avondale Mills Co., Birmingham, Ala., as secondhand in their upper weave room.

—Leon Fox, bookkeeper for Neyland & Quinn, has resigned and accepted a similar position with the Arnold Print Works, North Adams, Mass.

—Lee A. Fain, secondhand at Dilling Cotton Mills, Kings Mountain, N. C., has resigned to accept the position of night boss weaver at the Clinton (S. C.) Cotton Mills.

—G. A. Franklin, overseer of the cloth room at the No. 3 mill of the Clifton Mfg. Co., Clifton, S. C., has resigned owing to failing health. J. W. Kidd, formerly secondhand, has been promoted to succeed Mr. Franklin.

—J. F. Ferguson, recently with the Berkley Co., Berkley, R. I., has accepted the superintendency of the Boott Cotton Mills, Lowell, Mass.

—Dillon Earon, secondhand of carding in No. 2 Harmony Mill, Cohoes, N. Y., has resigned and accepted a position as boss carder with the Montmorency Cotton Co., Montmorency Falls, Que.

—A. R. Ennis has resigned as boss carder and spinner at the Toccoa Cotton Mills, Toccoa, Ga., and accepted the position of assistant superintendent at the Rocky Mount (N. C.) Cotton Mills.

—S. J. Duffer has accepted the position of overseer of weaving at the Palmetto (Ga.) Cotton Mills, C. M. Cable having resigned.

—D. M. Diffly recently employed as boss spinner at Cordele, Ga., is now in a similar capacity at the Alabama Cordage Co., Montgomery, Ala.

—H. V. Deaver, carder at the Red Bluff Mills, Clio, S. C., has resigned.

—S. J. Dufresne, foreman at the Warren Cotton Mills, West Warren, Mass., has resigned. A large number of the employees of the machine and wool department presented him with an easy chair and handsome smoking set.

—T. G. Brown, loom fixer at the Granby Cotton Mills, Columbia, S. C., has been promoted to the position of boss weaver at the Fairfield Cotton Mills, Winsboro, S. C.

—J. W. Black, formerly overseer of carding and spinning at the Louise Mills, Charlotte, N. C., has accepted the superintendency of the Kinston Cotton Mills, Kinston, N. C.

—L. Q. Barber, formerly secondhand of the Lockhart Mfg. Co.'s mill, Lockhart, S. C., has been promoted to take charge of the cloth room.

—Matthew Broadbent, recently with the Greene & Daniels Mfg. Co., Pawtucket, R. I., has accepted a position with the Hamlet Mills, Woonsocket, as overseer of frame spinning, Albert H. Greene having resigned.

—A. J. Cobb, formerly overseer of carding and spinning at the Gaffney (S. C.) No. 1 mill, has gone to Pacelot, S. C., to accept a position in the No. 3 mill.

—W. D. Cooksey, formerly overseer of spooling and warping department at the Gaffney Mfg. Co.'s No. 1 mill, Gaffney, S. C., has been promoted to overseer of carding and spinning department.

—W. T. Claytor, formerly second-hand of weaving for the Phoenix Mills, Nashville, Tenn., has accepted charge of the weaving department of the Sylvan Mills, Shelbyville, Tenn. William Preddy of the Dixie Cotton Mills, La Grange, Ga., has succeeded him.

—Edwin A. Davis, clerk at the Kerr Thread Mills, Fall River, Mass., has accepted a position with the American Thread Co., New York.

—W. A. Douglas, formerly with the Dallas Mfg. Co., Huntsville, Ala., has become boss of the picker room in the Maginnis Cotton Mills, New Orleans, La., succeeding James Shockley.

—George F. Ellam, for a number of years with the Whittenton Manufacturing Co., Taunton, Mass., as overseer, has resigned to engage in the mill business in Maine.

—J. Earnest, formerly fixer at the Camden (S. C.) Cotton Mills is now night overseer of weaving. Thomas Hurt, formerly of the Louise Mills, Charlotte, N. C., has succeeded him as fixer.

—G. C. Evans, of Alabama, has taken charge of the dye house of the Nantucket Cotton Mfg. Co., Spray, N. C.

—Z. M. Floyd has again taken charge of the weaving at the Palmetto (Ga.) Cotton Mills.

—Albert H. Greene, formerly overseer of frame spinning at the Hamlet Mills, Woonsocket, R. I., is now at B. B. & R. Knight's mills, Manchaug, Mass., in a similar position.

—J. B. Harkey, night superintendent for the Manchester Mfg. Co., Macon, Ga., has resigned.

—William J. Henderson, for 15 years employed at the Naumkeag Steam Cotton Co., Salem, Mass., has resigned and gone to Petersburg, Va.

—Samuel Holt, recently with the Skenandoa Cotton Co., Utica, N. Y., has secured the position of overseer of card-

ing at the Harmony Mills, Cohoes, N. Y.

—H. H. Hickman, who has been president of the Graniteville Mfg. Co., Graniteville, S. C., for 30 years, has resigned. His son, Tracy I. Hickman, who has been vice-president of the company for the past three years, has been elected to succeed his father.

—J. E. Hamby, formerly with the Fairfield Cotton Mills, Winnsboro, S. C., as boss weaver, has accepted charge of the weaving at the Chester (S. C.) Gingham Mill, which started up on April 17.

—J. L. James has resigned as overseer of weaving at the Chewalla Cotton Mill, Eufaula, Ala.

—David Jamieson, of Philadelphia, has become boss dyer at the Southern Cotton Mills, Bessemer City, N. C.

—J. T. Jackson, superintendent of the Blue Springs Mills, Oxford, Ala., has resigned and gone to Avondale, Ala.

—Michael Kenny has accepted a position as second-hand in the dye house of H. N. Slater, at Webster, Mass.

—J. Lawrence has secured the position of boss dyer at the Glenallan Mills, Winchendon, Mass. J. Drummond, whom he succeeded, has gone to Manchester, N. H.

—Robert Love, for a number of years with the Lancaster Mills, Clinton, Mass., is now with the Thorndyke Mfg. Co., Palmer, Mass., as foreman of the machine shop.

—Homer L. Lee, of Lonsdale, R. I., has been employed by the Kerr Thread Co., Fall River, Mass., to take charge of the top-roll covering department.

—J. W. Lanham, overseer of carding at the mill of the Cowpens Mfg. Co., Cowpens, S. C., has been made superintendent of that mill, and will retain his former position as well.

—W. D. McGuinn, overseer of weaving at the Huguenot Mills, Greenville, S. C., has acepted a position with Holt, Gant & Holt, Elon College, N. C., as overseer of weaving, beaming and twisting.

—J. A. B. Mehaffee, overseer of the dressing department of the Kincaid Mfg. Co., Griffin, Ga., has resigned and intends to go into the grocery business.

—R. S. Milliken, formerly superintendent of the Pemberton Co.'s mill, Lawrence, Mass., has accepted the superintendency of the Nashua Mfg. Co., Nashua, N. H.

—John A. McLoughlin, overseer of weaving at the Hamlet Mills, Woonsocket, R. I., has resigned to accept a similar position at the Manchaug Mills, Manchaug, Mass.

—M. Myrick is the new overseer of weaving at the Chewalla Cotton Mills, Eufaula, Ala.

—C. W. Moore has been appointed superintendent of the Kesler Mfg. Co.,'s mill, Salisbury, N. C. He was formerly with the Granite Mfg. Co., Haw River.

—John McConnell has resigned as overseer of carding and spinning at the Glenallan Mills, Winchendon, Mass., which position he held for 10 years, and has removed to Fitchburg.

—Andrew Mungall, for eighteen years overseer of fancy dyeing for the Amoskeag Mfg. Co., Manchester, N. H., has resigned. He is 71 years of age. His son, Thomas Mungall, succeeds him.

—A. B. Mitchell has succeeded E. M. Wade as overseer of slashing and drawing at the Proximity Mfg. Co.'s mill, Greensboro, N. C. Mr. Wade has gone to Chester, S. C.

—John H. Peel, overseer in the weave room in the mills of B. B. & R. Knight, Manchaug, Mass., has resigned and returned to Fall River, where he has a similar position. The employes of his department presented him with a gold watch and chain.

—Chandler M. Potter, overseer of the spinning at night at the Jefferson Mill of the Amoskeag Mfg. Co., Manchester, N. H., recently met with a serious accident. While passing from the picker room into the cotton sheds, instead of stepping into the passage-way, he stepped directly out of doors, falling about twenty feet to the ground. Upon examination it was found that a right rib was badly crushed and his head injured internally.

—W. S. Porter, formerly at Gaffney, S. C., is now overseer of weaving at night at the Fulton Bag and Cotton Mills, Atlanta, Ga.

—George B. Smith, who has been an employee of the Lowell Machine Shop, in the foundry department, for forty-eight years, the past twenty-four years as foreman, has severed his connection with the company. He was presented with a couch and reclining chair by his employees.

—John P. Thomson, of Providence, R. I., has gone to Mammoth Springs, Ark., to superintend the cotton mill at that place.

—J. V. Thomason, formerly of Roanoke Rapids, N. C., has been appointed to take charge of the weave room at the Camden Cotton Mill, Camden, S. C. He succeeds Joshua Booth.

—John Thompson, formerly overseer of weaving in Dwight Mills 5 and 6, at Chicopee, Mass., and more recently at Fiskdale, has returned to Chicopee.

—William W. Thayer, who has been overseer of weaving with the Thorndyke Mfg. Co., Palmer, Mass., for a number of years, has resigned.

—N. W. Williams, for ten years master mechanic with the Thorndyke Mfg. Co., Palmer, Mass., has resigned owing to poor health.

—A. L. Weir has succeeded A. Bain as superintendent of the Oneida Cotton Mills at Graham, N. C. Mr. Bain has accepted the superintendency of the new mill just put in operation by T. F. Lloyd at University Station, N. C.

—T. W. Wilmouth has been appointed superintendent of the Galveston (Tex.) Cotton Mills.

—George A. Whitney, superintendent of the Galveston (Tex.) City Cotton Mills, has become superintendent of the Dixie Cotton Mills at La Grange, Ga. The operatives of the Galveston Mills presented him a jeweled scarf pin.

—H. L. Witham, superintendent of the Roswell Mfg. Co., Roswell, Ga., has resigned and accepted the superintendency of the Fulton Bag and Cotton Mill, Atlanta, a.

—C. Wilkerson, formerly second-hand at the Sibley Mill, Augusta, Ga., has accepted a similar position at the John P. King Mill.

Woolen.

—Thomas S. Blacklock has resigned as boss dyer at the works of the Pawtucket Dyeing & Bleaching Co., Pawtucket, R. I. He was presented with a gold-headed cane by the employees as a token of their esteem.

—F. J. Brady, overseer of the finishing department of the Brown Mfg. Co., Dover, Me., has resigned.

—Dennis Connolly, overseer of the finishing department for the Tremont Worsted Co., Methuen, Mass., has resigned and gone to Worcester.

—Thomas Donlon, superintendent of the Endrick Woolen Mills, Great Barrington, Mass., has resigned, and Henry Cushing, late of Dexter, Me., but formerly of Great Barrington, has succeeded him.

—Dennis Duffy, boss carder in the mill of the Pondicherry Co., Bridgton, Me., has given up that position, and Mr. Parker, of that city, succeeds him.

—Hugo Dolge, formerly of Dolgeville, has accepted a position with the Canadian Felting Co., Winnipeg, Canada. Since his failure in Dryden, soon after the failure of his brother, Alfred Dolge, Hugo Dolge has held a position as superintendent of a mill in Peterboro, N. H.

—Henry Feiler, formerly of Warsaw, Ill., has accepted a position as beamer with the Griffon Co., Passaic, N. J.

—Daniel Furlong second-hand with the Winthrop Mills Co., Winthrop, Me., has been promoted to boss carder, succeeding William Fleming.

—Edward Flynn, overseer of No. 1 carding room of the Smith & Dove Mfg. Co., Andover, Mass., has resigned. The employees presented him with a tool chest.

—Arthur Greaves, of Moosup, Conn., has gone to Sherbrooke, Canada, where he has a position as overseer of drawing with the Paton Mfg. Co.

—John Gordon, of Putnam, Conn., has secured the position of overseer of spinning with the French River Textile Co., Mechanicsville, Conn.

—Charles A. Kennedy, boss dyer at the Bowden Felt Mills, Millbury, Mass., has resigned.

—James Kearney, boss spinner for the Pittsfield Mfg. Co., Pittsfield, Mass., has taken a similar position in Troy.

—Joseph Kettle, overseer of the card room at the Yocona Mill at Water Valley, Miss., has severed his connection with that firm, and Robert Dillon of Florence, Ala., has been appointed to succeed him.

—John McIntosh, boss dyer for James Roy & Co., West Troy, N. Y., has resigned. A. MacMillan will succeed him.

—John J. Supple, who has been for some time dyer with the Armour Felt Works at Chicago, has accepted a similar position with the Bowden Felt Mills at Millbury, Mass.

—John Shaw, boss dyer for David Armitage & Son, Chester, Pa., died last month.

—Harry Sheldon, formerly loom fixer at Lewisburg, Pa., has been appointed boss weaver for the Columbia Worsted Co., Wallingford, Pa.

Knit.

—W. N. Green is now employed as boss knitter for the Faith Knitting Co., of Averill Park, N. Y.

—John Howell of Amsterdam, N. Y., has been engaged by the Paragon Knitting Co., Mohawk, N. Y., as overseer of their carding department.

—Frank Fairfield, formerly with John H. Murphy & Co., Utica, N. Y., has secured the position of boss knitter with the Highland Knitting Mill, Utica, N. Y.

—Charles Ostrom, overseer of knitting in the No. 3 mill of the Victor Knitting Mills Co., Cohoes, N. Y., has resigned.

—G. E. Stevens has been appointed superintendent of the Pitman Mfg. Co., Laconia, N. H., succeeding C. J. Austin.

Deaths.

—John Hoyle, senior member of the firm of Hoyle, Harrison & Kaye, manufacturers of upholstery material, Philadelphia, Pa., died April 6th at his home on 2640 North Ninth St. He was born in England in 1850, where he worked for his father, a cloth manufacturer, in 1871 coming to this country. In 1880 he, together with Messrs. Harrison & Kaye, started in business with three looms. The firm now employs upwards of 1000 persons and has two large plants in Philadelphia.

—Daniel Holden, a prominent woolen manufacturer, died at his home in West Concord, N. H., very suddenly on April 11th. After finishing a meagre education, he worked on farms until his twenty-first year, when he began work in the flannel mill of H. G. Howe, in Belvidere (now a part of Lowell), being employed as watchman. In three years' time he was engaged to run the mill by contract. From 1837, for ten years, he was superintendent of the Chelmsford Co.'s mill in Dracut, and then removed to West Concord, where, together with an older brother, Benjamin F. Holden, he began the manufacture of woolen goods, which partnership continued 27 years, until the death of Benjamin F. Holden in 1847. A corporation was then formed under the name of the Concord

Manufacturing Co., of which Mr. Holden was elected treasurer and general agent, and held the former position at the time of his death. In 1853-56 he was also superintendent of the Saxonville Mills in Framingham, Mass., his business connection with his brother remaining the same during these years. All grades of blankets, in addition to various styles of flannels, were manufactured in the early years of their business, and for a number of years they also did quite a business in wool hosiery, but of late the production of the mills has been confined almost exclusively to flannels.

—John W. Macomber, treasurer of the New Bedford Cordage Co., New Bedford, Mass., died Saturday, April 1, aged 68. He was also a director in the Grinnell Mfg. Co., and held other positions of trust and honor.

—Charles F. Doyle, a member of the firm of North & Doyle, who operate the Anchor Hosiery Mill, Cohoes, N. Y., on women's and children's underwear, died recently at his home in that city, aged 55 years. He leaves a son and two daughters.

—Horatio N. Campbell died at his home in Providence, R. I., recently, aged 85 years. For 30 years he was engaged in the cotton and wool business in Westerly. His son, Horatio N. Campbell, Jr., now assistant treasurer of the Campbell Mills, entered into partnership with him in 1873, when Mr. Campbell removed to Providence, where he had since resided.

—William Campbell, one of the largest and most successful knit goods manufacturers in Vermont, died Saturday, April 8th. He had been in poor health for some years, but attended to business up to the noon of the day before his death. He died of consumption. Mr. Campbell came from Cohoes, N. Y., to Bennington, nine years ago, during these years having amassed a large fortune. He had just completed a yarn mill to run in conection with his knit goods establishment, and supplied it with new machinery at an expense of over $50,000. He is survived by a widow.

—John Campbell, overseer in the weaving department of Richardson & Pease, Marlborough, N. H., died recently of pneumonia, aged 51 years. He had worked in mills nearly all his life, being with the above firm for ten years.

—William Beattie, treasurer of the Beattie Mfg. Co., Little Falls, N. J., died at Pasadena, Cal., March 25, aged 61 years. He was the son of Robert Beattie, and was head of the firm of Robert Beattie & Sons, selling agents for the Beattie Mfg. Co.

—Russell M. Larned, at one time one of the best known cotton dealers in Providence, R. I., but who retired from active business a few years ago, died at his residence, 9 Charles Feld St., Providence, aged 81 years.

—James Thompson, Sr., died at his home in Valley Falls, N. Y., recently, after a lingering illness. He was the principal owner of the large mill at Valley Falls operated under the firm name of James Thompson & Co.

—Oliver Moorehouse, for thirty years an employee of Seville, Schofield & Sons, Manayunk, Philadelphia, Pa., died suddenly while at work in the mill, aged 69 years.

—Asa Crowell died at his home, 465 Hope St., Pawtucket, R. I., April 16th. He was superintendent of the Cumberland Mills, Cumberland, N. C., for 30 years, a part of the time being a director. He retired in 1897, when he removed to Pawtucket. A widow and one son, Asa C. Crowell, professor of Germanic languages at Brown University, survive him.

—Jacob B. Cundall, superintendent of the Island Woolen Co., at Baraboo, Wis., died in that city the latter part of March, of Bright's disease. He was at one time superintendent for Joseph Dews, East Greenwich, R. I., later with William Tillotson, Pittsfield, and afterwards with Phillips & Kunhardt, Lawrence, Mass. He then associated himself with W. D. Hills in the woolen manufacturing business at Auburn, N. Y. He had been in Baraboo for about three and a half years.

—James S. Patterson died recently at his home on West Third St., Jamestown, N. Y. The Empire Worsted Mills, of which he was the largest stockholder, and the Union Trust Co., of which he was president, are largely indebted to him for their success.

—Herman H. Schwietering, of the firm of H. H. Schwietering & Co., woolen importers, New York, died at his home, No. 28 West Seventy-sixth St., April 10th, of heart failure. Mr. Schwietering established the firm in 1871.

—Major Julian Ransome committed suicide in the night of April 12. He had taken morphine. He was largely interested in the Eagle & Phenix Mills of Columbus, Ga., and through their failure lost many thousand dollars, which loss of fortune, together with poor health for some months past, it is thought, affected his mind.

—Frank Johnson, overseer of spinning in the Galveston (Texas) Cotton Mills, died on March 29th. He has been at the Galveston Mills for over two years, coming from the Boston Duck Mills, Bondsville, Mass.

—Richard W. Jones died in Clayville, N. Y., recently, aged 80 years. He was a boss weaver, and for some years was employed in the Globe Woolen Mills, Utica, N. Y. In 1871, he retired to his farm, where he resided until his death.

—Dennis Murray, superintendent of the Ogden Mill of the Harmony Co., Cohoes, N. Y., died recently, aged 69 years.

†All Belts with CLING-SURFACE on them can be run as slack as this.

This Little Belt (12 in.) was our first slack belt. It earned $640.00 in two years, in increased power, at a cost of only $63.00 for CLING-SURFACE, for the whole plant.

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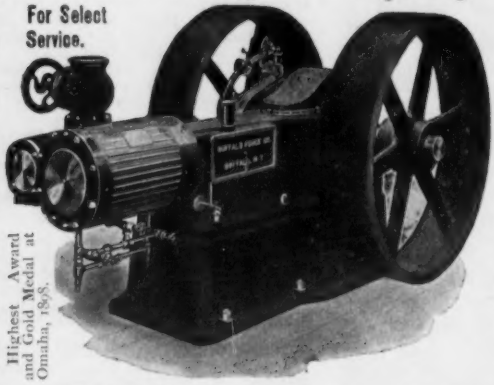

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New York. Chicago.

BUYERS' INDEX.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Alphabetical Index to Advertisements follows this Classified List.

Architects and Mill Engineers.

Berlin Iron Bridge Co, The, East Berlin, Ct.
Ferguson, John W., Paterson, N. J.
Tower & Wallace, Broadway and 25th St., New York, N. Y.

Automatic Feeds for Cotton and Wool.

Woonsocket Machine & Press Co, Woonsocket, R. I.

Balling Machine.

Torrance Mfg. Co, 18 Davis St, E. Newark, N. J.

Bandings.

See under Yarns.

Belting.

Albany Belting & Supply Co., Albany, New York.
Alexander Bros., 410 No. 3d St., Phila., Pa.
Boston Belting Co., 256 Devonshire St., Boston, Mass.
Link Belt Machinery Co., Chicago, Ill.
Popham, Henry, & Son, Newark, New Jersey.
See also Mill Supplies.

Belt Dressing.

Alexander Bros, 410 No. 3d St, Phila, Pa.
Cling Surface Co., 168 Virginia St., Buffalo, N. Y.

Belt Hooks.

Field, Frank E., New Haven, Conn.

Bindings.

See Tapes and Braids.

Bleaching Materials.

Roessler & Hasslacher Chemical Co, 100 William St, New York.

Bobbin Holder and Thread Catcher.

Burr Bobbin Holder and Thread Catcher Co., Hartford, Conn.

Bobbins, Spools, Shuttles, Etc.

Nashua Spool and Bobbin Co., Nashua, N.H.

Boxes, Cloth Boards, Etc.

Pearson, J. T, Kensington, Pa.

Braids.

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Brass (Perforated.)

See under Perforated Metal.

Brushers.

See Napping Machines.

Burr Pickers.

Curtis & Marble Machine Co., Worcester Mass.
Sargent's, C. G., Sons, Graniteville, Mass.

Card Clothing.

Ashworth, Elijah, Fall Biver, Mass.
Leigh, Evan A, 35 Mason Building, Boston.

Calico Printers' Machinery and Supplies.

Birch Brothers, Somerville, Mass.
Butterworth, H. W., Sons & Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
New Bedford Copper Co, New Bedford, Mass.
Phillips Co, The Thomas, Providence, R. I.
See also Dyeing, Bleaching Machinery, etc.

Carders' Tools.

Brown, W. H, Mechanic St, Worcester, Mass.

Carpet Machinery.

Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
Curtis & Marble Machine Co, Worcester, Ms.
Furbush, M. A, & Son, Machine Co, Phila, Pa.
Granger Foundry & Machine Co., Providence, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Chemicals and Apparatus.

Bullock & Crenshaw, 528 Arch St, Phila, Pa.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Chemist.

Adriance, John S., 105 East 39th St., New York.

Cloth Testing Machine.

McKnight, S., 75 Spring St, New York.

Combs (Wool and Cotton).

Crabb, William, & Co, Newark, N. J.

Commission Merchants (Dry Goods).

Dusenbury, C Coles, & Son, 396-398 Broadway, New York.
Hayes, O. H., 10 Thomas St., New York.

Copper (Perforated.)

See under Perforated Metal.

Copper Print Rollers.

New Bedford Copper Co, New Bedford Mass.
Phillips Co, The Thomas, Providence, R. I.

Copper Work for Dyers.

Butterworth, H. W. & Sons Co., Philadelphia.
Burkhard, Thomas, 494 Flushing Ave., Brooklyn, N. Y.
Granger Foundry & Machine Co., Providence, R. I.
Phillips Co, The Thomas, Providence, R. I.

Cotton (Egyptian).

Stoddard, Haserick, Richards & Co., Boston.

Cotton Machinery.

Altemus, W. W, & Son, 2816 N. 4th St, Phila. Pa.
Ashworth, Elijah, Fall River, Mass.
Butterworth, H. W. & Sons Co., Philadelphia.
Cobb, Thad. S., Machinery Co., Lowell,
Curtis & Marble Machine Co, Worcester, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Co, 22d and Wood Sts, Philadelphia.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa.
Philadelphia Textile Machinery Co, Hancock and Somerset Sts, Philadelphia, Pa.
Phillips Co, The Thomas, Providence, R. I.
Stoddard, Haserick, Richards & Co, Boston, Mass.
Whitin Machine Wks, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Cotton Openers and Lappers.

Howard & Bullough American Machine Co, Pawtucket, R. I.

Cutters for Knit Fabrics.

Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y

Designer.

William Keiller, 28 Queen St, Belfast, Ire.

Dextrine.

Stein, Hirsh & Co, 165 Duane St., New York.

Dryers.

Birch Brothers, Somerville, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Butterworth, H. W. & Sons Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co, Philadelphia, Pa.
Phillips Co, The Thomas, Providence, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Dusters.

See Wool and Waste Dusters.

Dyers, Bleachers and Finishers.

Brophy's, T, Sons, Jasper St, Philadelphia.
Greenwood, R, & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Littlewood, G. J., & Sons, Manayunk, Pa.
Merchants Dyeing Co., Sedgwick St., Chicago, Ill.
Orianna Bleach Works, 2560 No. 3d St., Philadelphia.
Rowland, Samuel, Schuylkill Haven, Pa.
Warren, W, Thread Works, Westfield, Mass.

Dyeing, Drying, Bleaching and Finishing Machinery.

Birch Bros., Somerville, Mass.
Butterworth, H. W, & Sons Co, Phila, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Co, 22 and Wood Sts, Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Hopkins, A, & Co, Bridgeton, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Lincoln, The, Co, 54 Arch St, Hartford, Ct.
Phenix iron Foundry, Providence, R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa.
Philadelphia Textile Machinery Co, Hancock and Somerset Sts, Philadelphia, Pa.
Phillips, The Thomas Co, 91-95 South Main St, Providence, R. I.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)
Woonsocket Machine & Press Co, Woonsocket, R. I.
Woonsocket Napping Machine Co, Woonsocket, R. I.

Dye Sticks,

Bailey, Frank, Cedar Brook, New Jersey.
Haedrich, E. M, 311 1-2 Walnut St, Phila, Pa.

Dyestuffs and Chemicals.

Amend Process Co., 205-211 Third Ave., New York.
American Aniline Co., 138 No. Front St., Philadelphia.
Anchor Color Mfg. Co, 464 Cherry St, New York.
Atteaux, F. E. & Co., 174-176 Purchase St., Boston.
Berlin Aniline Works, 72 Front St., N. Y.
Bischoff, & Co, 87 Park Place, N. Y.
Bosson & Lane, 36 Central Wharf, Boston.
Corey, S. J, 273 Congress St, Boston.
Dillon & Co, 20 Cedar St, New York.
Farbenfabriken of Elberfeld Co, 40 Stone St, N. Y.
Geisenheimer & Co, 189 Front St, New York.
Innis & Co, 3 Cedar St, New York.
Jaeck Bros., The, Co., 62-68 No. 11th St, Brooklyn, N. Y.
Janney, O. S, & Co, Phila. and Boston.
Johnson, Chas. A, & Co, 22 Dey St, N. Y.
Johnson, Wm. G, & Co, Uncasville, Conn.
Keller, John J, & Co, 104-106 Murray St, N. Y.
Klipstein, A, & Co, 122 Pearl St, N. Y.
Koechl, Victor, & Co, 122 Hudson St, N. Y.
Matheson, W. J, & Co, 182-184 Front St, N. Y.
Merrimac Chemical Co, Boston, Mass.
N. Y. & Boston Dyewood Co, 55 Beekman St, New York.
Oakes Mfg. Co, 93 Pearl St, N. Y.
Palmetto Co., The, 942 44 Drexel Building, Philadelphia.
Pickhardt & Kuttroff, New York.
Richmond & Foley, 153 N. Front St., Philadelphia.
Roessler & Hasslacher Chemical Co, 100 William St., New York.
Sharpless Dye Wood Ext. Co, 22 N. Front St, Phila, Pa.
Stamford Mfg. Co, 133-137 Front St., N. Y.
Stone & Ware Co, The, 157 Maiden Lane, N. Y.
Sykes & Street, 85 Water St, N. Y.
Thomas, N. Spencer, Elmira, New York.

Dyers and Finishers.

American Yarn Printing Works, 134-150 North 22d St., Philadelphia.
Boston Finishing Works, Williamstown Mass.
Cohoes Dye Works, Cohoes, N. Y.
Cranston Worsted Mills (yarns), Bristol R. I.
Firth & Foster Co, Kensington, Pa.
Greenwood, R, & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket, R. I.
Novelty Dye Works, Cincinnati, Ohio.
Pawtucket Dyeing & Bleaching Co, Pawtucket, R. I.
Warren, W, Thread Works, Westfield, Mass.

Edgings.

See Tapes, Braids and Edgings.

Electrical Engineer.

W. S. Kelley, 30 Nightingale St., Boston.

Electrotyping and Printing.

Whitcomb, H. C, & Co, Boston.

Elevators.

Cohoes Foundry & Machine Co, Cohoes, N. Y.
Eastern Machinery Co, The, New Haven, Conn.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Engineers, Mechanical.

Ferguson, John W, Paterson, N. J.

Express Money Orders and Travelers' Cheques.

American Express Co, offices in every city

Fans—Exhaust and Ventilating.

See Ventilating Apparatus.

Feed Water Pumps.

Goulds Mfg. Co, Seneca Falls, N. Y.
Phœnix Iron Foundry, Providence, R. I.

Filters for Water.

New York Filter Mfg. Co., 26 Cortlandt St., New York.

Finishing Machinery.

See Dyeing, Drying, Bleaching and Finishing.

Fire Extinguishers.

H. R. Bennett, 1217 Filbert St., Phila.

Fluted Rolls.

Cohoes Foundry & Machine Co, Cohoes, N. Y
Thurston, A. G, & Son, Box 528, Fall River. Mass.

Fulling Mills for Woolen Goods.

Hopkins, A, & Co. Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter Jas, Machine Co, No. Adams, Mass.

Gas Engines.

Jones, Lewis, 60½ and Media Sts, Phila, Pa.

Gas Singeing Machines.

Birch Brothers, Somerville, Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Ms.
Granger Foundry & Machine Co., Providence, R. I.

Gear Cutting Machine.

Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E, Co, New London, Conn.

Grates (Boiler).
Earl & Wilson Co, Gastonia, N. C.

Harness Varnish.
D. L. Witmer & Bro, 5th St. and Germantown Ave, Philadelphia.

Heating.
See Ventilating.

Heddles.
Watson, L. S, Mfg. Co, Leicester, Mass.

Hosiery Boards.
Pearson, J. T, Kensington, Pa.

Hose and Rubber Goods.
Boston Belting Co., 256 Devonshire St., Boston.

Hydro Extractors.
American Tool & Machine Co., Boston.

Ink, Stamping.
Witmer, D. L, & Bro, 5th St. and Germantown Ave, Philadelphia.

Insurance (Employers' Liability).
Employers' Liability Assurance Co, 26 Central St, Boston, Mass.

Knit Goods Edgings, Trimmings, etc.
Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Friedberger & Co, Edgings, Germantown Phila, Pa.
Hepner & Horwitz, Lacings, 30 Howard St, N. Y.
Krout & Fite Mfg. Co, 2632 Mascher St, Phila.
Weimar Bros, 1817 East York St, Phila. Pa.

Knit Goods Finishing Machines, Crochet, Etc.
Excelsior Sewing Machine Co, 120 N. 7th St, Phila, Pa.
Merrow Machine Co, The, Hartford, Conn.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 2079 E. Cumberland St, Phila Pa.

Knitting Machine Cylinders.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Stafford & Holt, Little Falls, N. Y.

Knitting Machinery.
Beattie Machine Works, Cohoes, N. Y.
Branson Machine Co., 506 John St., Philadelphia.
Campbell & Clute, Cohoes, N. Y.
Cooper, Chas, Bennington, Vt.
Crane Mfg. Co, Lakeport, N. H.
Excelsior Knitting Machine Manufacturing Co., Allentown, Pa.
Hepworth & Co, Lehigh Ave. and Mascher St, Phila, Pa.
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
Kennedy, Thos. (Cutters, etc.), Cohoes, N. Y.
Leighton Machine Co, Manchester, N. H.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
McMichael & Wildman Mfg. Co, Norristown, Pa.
Mueller, A, 760 Lexington Ave, Brooklyn, N. Y.
Nye & Tredick, 606 Arch St, Phila, Pa.
Paxton & O'Neill, 127 Bread St, Phila, Pa.
Pepper Mfg. Co, Lakeport, N. H.
Scott & Williams, 2079 E. Cumberland St., Phila., Pa.
Stafford & Holt, Little Falls, N. Y.

Knitting Needles and Supplies.
Breedon, Wm, & Son, Amsterdam, N. Y.
Cooper, Chas, Bennington, Vt.
Corey, Wm, Co, Manchester, N. H.
Crane Mfg. Co, Lakeport, N. H.
Dodge Needle Co., Manchester, N. H.
Ives, Loyal T, New Brunswick, N. J.
Lydall, H, & Foulds, Manchester, Conn.
Manufacturers' Supplies Co., 66 No. 4th St., Philadelphia.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
Page Needle Co, Chicopee Falls, Mass.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co, Lakeport, N. H.

Laboratory Outfits.
Bullock & Crenshaw, 528 Arch St. Phila, Pa.

Lamps, Electric.
Edison, Thomas A., Jr., 27 William St., New York.
Gilmore Electric Co, L and 1st Sts, South Boston.

Looms.
Draper Company, Hopedale, Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A, & Son Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St, Phila, Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Whitin Machine Works, Whitinsville, Ms,
Woonsocket Machine & Press Co, Woonsocket, R. I.

Lubricators.
Ameledema Oilless Bearing Co., Berkeley St, Wayne Junction, Philadelphia.
Dixon, Jos., Crucible Co, Jersey City, N. J.
Graphite Lubricating Co., Bound Brook, N. J.

Lumber.
Stearns, A. T, Lumber Co, Neponset, Mass.

Lumpers.
Gerry, George, & Son, Athol, Mass.

Machinery Dealers.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.

Machinists' Tools.
Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E. Co, New London, Conn.

Mails.
Walder, J, Paterson, N. J.

Measuring and Folding Machines.
Curtis & Marble Machine Co, Worcester, Ms.
Elliott & Hall, 54½ Hermon St, Worcester Mass.

Mills For Sale.
Denny, R. B., 143 Federal St., Boston.

Mill Builders and Engineers.
Berlin Iron Bridge Co, The, East Berlin, Ct
Ferguson, John W, Paterson, N. J.

Mill Supplies.
American Supply Co, Providence, R. I.
Bamford & Smith, Pascoag, R. I.
Bristol, The, Co., Waterbury, Conn.
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Mitchell-Bissell Co., 170 Summer St., Boston.
Thurston, A. G, & Son, Fall River, Mass.
Watson, L. S, Mfg. Co, Leicester, Mass.

Napping Machines.
American Napping Machine Co, Williamstown, Mass.
Ardrey, S. B, & Sons, Bristol, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 60 1-2 and Media Sts., Philadelphia, Pa.
Woonsocket Napping Machine Co, Woonsocket, R. I.

Pantagraphs for Mill Engraving.
Johnson, C. A, & Co, 22 Dey St, New York.

Patterns of European Novelties.
European Pattern Supply Co., 530 Broadway, N. Y.
European Textile Sample Co., 56 Worth St., New York.

Patent Solicitors.
Crosby & Gregory, 34 School St, Boston, Mass.
Wright, Brown & Quinby, 53 State St, Boston, Mass.

Perforated Metal.
Beckley, A. J. & Co., Garwood, N. J.
Harrington & King Perforating Co., 230 North Union St, Chicago. Ill.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co., 100 William St, New York.

Picker Sticks.
La Bar, L. T., Beateyestown, N. J.

Picking, Carbonizing and Garnetting.
Garfield Woolen Co, Garfield, N. J.
Kennebec Woolen Mills 2025 Naudain St., Philadelphia.

Pipe Covering (Magnesia).
Keasby, R. A, 83 Warren St, New York.

Pneumatic Conveying.
See Ventilating.

Porcelain Guides.
Mitchell-Bissell Co., 170 Summer St., Boston.

Power Transmitting Machinery.
Ameledema Oilless Bearing Co, 149 West Berkley St, Wayne Junction, Pa.
Channon, H, Co, 25 Market St, Chicago, Ill.
Christiana Machine Co., Christiana, Pa.
Eastern Machinery Co, New Haven, Conn.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jones, W. A, 53-59 South Jefferson Street, Chicago, Ill.
Kilburn, Lincoln & Co, Fall River, Mass.
Link Belt Machinery Co, Chicago, Ill.
Saginaw Manufacturing Co., Saginaw, Mich.
Wall, William F. Rope Company, 56 South St., New York.

Presses.
Boomer & Boschet Press Co., 338 West Water St., Syracuse, N. Y.
Butterworth, H. W. & Sons Co., Philadelphia
Crawford. J. J, & Son, Nashua, N. H. (Power Screw, Hydraulic, Hollow Steam Plate.)
Curtis & Marble Machine Co, Worcester, Ms.
Hart, Charles, Frankford, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Phillips Co, The Thomas, Providence, R. I.
Sullivan Machinery Co., Claremont, N. H.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Pressing Irons, Gas and Air Heated.
Economical Gas Iron Co., C. H. Sheftall, Mgr., 305 307 Mercer St., New York.
Edwards Sad Iron Co , 1420 Chestnut St., Philadelphia.

Printers and Embossers.
Novelty Textile Printing Co, 447-449 W. 14th St, New York.

Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.

Quills.
Parker, Henry, Co., Springfield, Vt.

Reed and Harness Manufacturers.
American Supply Co, Providence, R. I.
Walder, J, Paterson, N. J.

Ribbons.
Cheney Bros, S. Manchester, Ct.

Roofing, Gravel, Slag and Composition.
Armitage Mfg. Co, Richmond, Va.

Roofing, Paint and Paper.
Armitage Mfg. Co, Richmond, Va.

Roving Cans and Sheet Metal Work for Mills.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.
Sullivan Machinery Co, Claremont, N. H.
Walrus Fibre Mfg. Co., Medford, Mass.

Schools.
American Correspondence School of Textiles, Lowell, Mass.
Lawrence Scientific School, Cambridge, Mass.
Lowell Textile School, Lowell, Mass.
Philadelphia Textile School, Phila, Pa.

Screens (Perforated.)
See under Perforated Metal.

Sewing Machines and Supplies.
Birch Bros., Somerville, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Frame, Gibbons, 2nd and Diamond Sts, Phila, Pa.
Manufacturers' Supplies Co., 66 No. 4th St., Philadelphia.
Nye & Tredick, 906 Arch St, Phila, Pa.
Standard Sewing Machine Co, Cleveland, Ohio.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Union Button Sewing Machine Co., 164 High St., Boston, Mass.

Shearing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Shell Rolls.
Cohoes Foundry & Mach. Co, Cohoes, N. Y.
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Shoddies.
See Wool Shoddies.

Shuttles.
See Bobbins, Spools, Shuttles, Etc.

Shuttle Eyes.
Mitchell-Bissell Co., 170 Summer Street, Boston.

Silk Machinery.
Butterworth, H. W. Sons Co, Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.

Singe Plates.
Butterworth, H. W. Sons Co., Philadelphia.
New Bedford Copper Co, New Bedford, Mass

Sizing, Starch and Gums.
Quaker City Chemical Co., Wayne Junction, Philadelphia.
Stein, Hirsch & Co, 165 Duane St, New York.

Slashers.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Lowell Machine Shop, Lowell, Mass.
Phillips Co, The Thomas, Providence, R. I.

Soaps.
Holbrook Manufacturing Co., New York.
India Alkali Works, Boston, Mass.

Spindles.
Buckley, Benj's, Sons, Gun Mill, Paterson, N. J.
Draper Company, Hopedale, Mass.
Ward & Vandegrift, Elmer, N. J.
Whitin Machine Wks, Whitinsville, Mass.

Spindle Tubes.
Bamford & Smith, Pascoag, R. I.

Spinning Cylinders.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Spinning Frames.
See Cotton Machinery.

Spinning Frames for Wool
Woonsocket Machine and Press Co., Woonsocket, R. I.

Spinning Rings.
Draper Company, Hopedale, Mass.
Whitinsville Spinning Ring Co, Whitinsville, Mass.
Worcester Spinning Ring Co., Worcester, Mass.

Spinning Tubes.
Buckley, Benj's. Son, Gun Mill, Paterson, N. J.

Steam Boilers.
Brown, C. H, & Co, Fitchburg, Mass.

Steam Boiler Insurance.
Hartford Steam Boiler Inspection & Insurance Co. Hartford, Conn.
Mutual Boiler Insurance Co, 31 Milk St, Boston.

Steam Engines.
Brown, C. H, & Co, Fitchburg, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Hooven (The), Owens & Reutschler Co, Hamilton, O.

Steam Specialties.
Butterworth, H. W. Sons Co., Philadelphia.

Tanks, Tubs and Vats.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Challenge Wind Mill & Feed Mill Co, 195 High St, Boston, Mass.
Corcoran, A. J, 11 John St, New York.
Cypress Lumber Co, Apalachicola, Fla.
Stearns, A. T, Lumber Co, Neponset, Mass.
Woolford, George, 2240 No. 9th St, Phila, Pa

Tapes, Braids and Edgings.
Cathcart, John, & Co, 115 Franklin St, N. Y.
Fleming & Chapin. 229 Church St., Phila.
Friedberger & Co, Germantown, Pa.
Hamilton, J. H , & Co, 275 Church St, N. Y.
Krout & Fite Mfg. Co., Allegheny Ave. and Emerald St., Philadelphia.
Thun & Janssen, Reading, Pa.
Weimar Bros, 1817 East York St, Phila, Pa.
Young, Wm. M, 3638-40 Frankford Ave, Philadelphia, Pa.

Telephones.
F O. Flummer, 620 Atlantic Ave., Boston.

Tentering Machines.
See Dyeing, Bleaching Machinery, Etc.

Tension Pulleys.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Testing Machines.
Howard, Geo. C., 1783 Barker St., Phila., Pa

Towers.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Challenge Wind Mill & Feed Mill Co, Boston, Mass.

Traveler's Cheques.
American Express Company.

Turbines.
(See Water Wheels.)

Ventilating Apparatus.
Allington & Curtis Mfg. Co., Saginaw, Mich., and East Cambridge, Mass
Berry, A. Hun, 23 W. 1st St, Boston, Mass.
Buffalo Forge Co., Buffalo, N. Y.
New England Ventilating & Heating Co, Providence, R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philapelphia.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Washers (Cloth).
Birch Brothers, Somerville, Mass.
Butterworth, H. W. & Sons Co., Philadelphia.
Hopkins, A, & Co, Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Phillips Co, The Thomas, Providence, R. I.

Watches and Clocks.
Elgin National Watch Co., Elgin, Ill.

Watchman's Clock.
Eco Magneto Clock Co, 620 Atlantic Ave, Boston.
Nanz & Co, 116A Chambers St, New York.

Water Wheels.
Bradway, C. P., W. Stafford, Ct.
Christiana Machine Co., Christiana, Pa.
Humphrey Machine Co., Keene, N. H.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, O.

Water Wheel Governors.
Bradway, C. P, West Stafford, Ct.
Cohoes Foundry & Machine Co, Cohoes N. Y.
Leffel, James & Co, Springfield, Ohio.
Lombard Water Wheel Governor Co, 61 Hampshire St, Boston.

Winders. (Hosiery.)
Universal Winding Co, 226 Devonshire St, Boston.

Wood Pulleys.
Saginaw Manufacturing Co, Saginaw, Mich.

Wool.
Pratt, Daniel S., 180 Summer St, Boston

Wool Cleaning Compound.
India Alkali Works, Boston.

Wool Combing Machinery.
Crabb, Wm, & Co, Newark, N. J.
Townsend, Thomas, 157 Orange St, Providence, R. I.

Wool Extracts.
Garfield Woolen Co, Garfield, N. J.

Wool and Waste Dusters.
Gerry, Geo, & Son, Athol, Mass.
Sargents', C. G., Sons, Graniteville, Mass.
Stillman-Randall Machine Co, Westerly, R. I.

Woolen and Worsted Machinery.
Altemus, W. W, & Co, 2316 N. 4th St, Phila Pa.
American Tool and Machine Co., Boston.
Atlas Manufacturing Co , Newark, N. J.
Birch Brothers, Somerville, Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Cobb, Thad. S., Machinery Co., Lowell, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Philadelphia Drying Machinery Co., 6721 Germantown Ave , Philadelphia.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Philadelphia.
Phillips Co. The Thomas, Providence, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Stoddard, Haserick, Richards & Co, Boston, Mass.
Woonsocket Machine & Press Co Woonsocket, R. I.
Woonsocket Napping Machine Co., Woonsocket, R. I.

Wool, Hair and Noils.
Becker, Chas. W, Agt, Amsterdam, N. Y.
Fowles & Co, 106 Church St, Phila.

Wool Shoddies.
Becker, Chas. W, Agt, Amsterdam, N. Y
Garfield Woolen Co, Garfield, N. J.
Slack, Wm. H. B., & Bro, Springfield, Vt.

Wool Sorters, Scourers and Carbonizers.
Morse Wool Treating Co., Norton, Mass.

Wool Washing, Preparing and Drying Machinery.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Phillips Co, The Thomas, Providence, R. I
Sargent's, C. G, Sons, Graniteville, Mass.

Woolen Commission Merchants.
Hayes, O. H. & Co., New York.

Yarns, Threads, Etc.

Banding.

Moore, C. & Co, 12 S. 5th St, Phila, Pa.
Warren, W, Thread Works, Westfield, Mass.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Tucker & Cook Mfg. Co, Conway. Mass.
Whittier Cotton Mills, Lowell, Mass.

Cotton Yarns.

American Cotton Yarn Exchange, 45 Milk St., Boston.

Catlin & Co, New York and Boston.
Clark, Wm, Co, Westerly, R. I.
Cohannet Mills, Taunton, Mass.
Crossland, Enos, Sons, Philadelphia, Pa.
Dana Warp Mill, Westbrook, Me.
Eddy & Street, Providence, R. I.
Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Fleming & Chapin, Philadelphia.
Germantown Spinning Co, Germantown, Pa.
Grant Yarn Co, Fitchburg, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hadley Co, Holyoke, Mass.
Indian Orchard Co., Indian Orchard, Mass.
Jenckes, E., Mfg. Co., Pawtucket, R. I.
Mitchell, Jas. E, & Co, Boston and Phila, Pa.
Montgomery, J. R, Co, Windsor Locks, Ct.
Monument Mills, Housatonic, Mass.
Orswell Mills, Fitchburg, Mass.
Sanford Spinning Co, Fall River, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Cotton Mills, Lowell, Mass.

Gassed Yarns.

Greene & Daniels Mfg. Co, Pawtucket, R. I.

Glazed Yarns.

Eichmann & Sternberg, 530 Broadway, cor Spring St., N. Y.
Indian Orchard Co., Indian Orchard, Mass.
Malcolm Mills Co, Frankford, Pa.
Meyer, John C. & Co., 87 Summer St., Boston.
Montgomery & Co, J. R, Windsor Locks, Ct.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Harness Twines.

Cranston Worsted Mills, Bristol, R. I.
Fawcett, Hughes, 115 Franklin St., N. Y.
Hadley Co, 95 Milk St, Boston, Mass.
Moore, C., & Co., (S. W. cor. 5th and Market Sts.)
Warren, W, Thread Works, Westfield, Mass
Whittier Cotton Mills, Lowell, Mass.

Hosiery and Knitting Yarns.

Boyer, B. F, & Co, Camden, N. J.
Campbell, Geo, & Co, Phila, Pa.
Clark, Wm, Co, Westerly, R. I.
Clasgens, The J. & H. Co, New Richmond, Ohio.
Cohannet Mills, Taunton, Mass.
Colchester Mills, 86-88 Franklin St, New York.
Cranston Worsted Mills, Bristol, R. I.
Eichmann & Sternberg, 530 Broadway, cor. Spring St , N. Y.
Germantown Spinning Co, Germantown, Pa.
Greene & Daniels Mfg. Co. Pawtucket, R. I.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E., Manufacturing Co, Pawtucket, R. I.
Mitchell, James E, & Co, Phila. and Boston
Monument Mills, Housatonic, Mass.
New England Thread Co, Pawtucket, R. I.
Orswell Mills, Fitchburg, Mass.
Rockwell, E. M, Leominster, Mass.
Sanford Spinning Co, Fall River, Mass.
Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
Skerry, A T, & Co, 47 Leonard St, N. Y.
Walcott & Campbell Spinning Co, New York Mills, Oneida Co, N. Y.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Flax, Hemp, Jute and Ramie.

Eichman & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Fawcett, Hughes, 115 Franklin St., N. Y
Holland & Webb, N. Y.

Mohair Yarns.

Cranston Worsted Mills, Bristol, R. I.
Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Novelty Yarns, Tinsels, Silk Noils, Etc.

Cranston Worsted Mills, Bristol, R. I
Eichmann & Sternberg, New York City.
Indian Orchard Co., Indian Orchard, Mass.
Malcolm Mills Co, 229 Chestnut St, Phila, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Silk Yarns.

Cheney Bros, S. Manchester and Hartford Ct.
Eddy & Street, Providence, R. I.
Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Meyer, John C, & Co., 87 Summer St., Boston.
Ryle, Wm, & Co, 54 Howard St, N. Y.

Woolen and Merino Yarns.

Boyer, B. F, & Co, Camden, N. J.
Clasgens, The J. & H. Co, New Richmond, Ohio.
Crossland's Enos, Sons, Philadelphia.
Eddy & Street, Providence, R. I.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E. Mfg. Co., Pawtucket, R. I.
King, Alexander & Co, 54 Leonard St, N. Y.
Rockwell, Edward M, Leominster, Mass.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

Worsted Yarns.

Alleghany Worsted Mills, Phila, Pa.
Botany Worsted Mills, Passaic, N. J.
Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Campbell, Geo. & Co, Phila, Pa
Campion, Richard, 17 Bank St., Philadelphia.
Cranston Worsted Mills, Bristol, R. I.
Croft, Howland, & Sons, cor. Broadway and Jefferson Ave., Camden, N. J.
Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Elsasser, Albert R, Addingham, Pa.
Goff, D. & Sons, Pawtucket, R. I.
Herbst & Jones, 21st and Naudain Sts, Philadelphia, Pa.
King, Alexander & Co, 54 Leonard St, N. Y.
Phoenix Mills Co, 13 Letitia St, Phila, Pa.
Pocasset Worsted Co., Thornton, R. I.
Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Waverly Worsted Co, Main St. and Green Lane, Manayunk, Pa.

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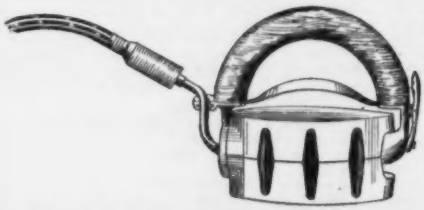

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Detailed information is given about each establishment, viz., the name of the company or firm, names of officers, agent, superintendent, what the mill makes, number sets of cards and combs (if woolen), number of spindles, number of looms, whether steam or water power, whether a dye house or not, who the selling agents are, or if the mill sells direct. In many instances it gives the name of the buyer of raw materials and supplies. To the travelling man, this directory is invaluable, as the maps give the location of the towns where there are mills, so that trips may be planned. The railroad connections are given, and distances may be estimated accurately from the maps.

IT ALSO HAS LISTS OF LARGE BUYERS OF TEXTILE FABRICS FROM FIRST HANDS INCLUDING MANUFACTURERS' SELLING AGENTS AND DRY GOODS COMMISSION MERCHANTS IN PRINCIPAL CITIES; THE MANUFACTURING CLOTHIERS, SUIT AND CLOAK MAKERS, JOBBERS, LARGE RETAILERS BUYING FROM FIRST HANDS. ALSO LISTS OF DEALERS IN RAW MATERIALS IN PRINCIPAL CITIES, INCLUDIND RAG DEALERS. BUYERS' INDEX OF TEXTILE MACHINERY AND SUPPLIES.

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A copy of this Directory is presented to every paid-in-advance subscriber to the TEXTILE WORLD, with the compliments of the publisher. The price to others is $2.00 or $3.00 according to binding.

Those who want the all-cloth cover book at $3.00 (including the Textile World), should speak early as the supply is limited.

TEXTILE BOOKS.

The following are recent publications, which we will furnish upon receipt of their price.

Plain Series of Cotton Spinning Calculations, by William H. Cook, 91 pages.

This book gives original calculations relating to cotton spinning, giving the position of the different pulleys and wheels, which are taken into consideration when making calculations; and also points where the necessary changes are made when altering from one count to another. Price $1.

Sizing Ingredients, Size Mixing and Sizing. By Hugh Morrie, Jr., 63 pages, Illustrated.

This book is intended to be a complete practical work dealing with everything relating to the modern processes of sizing, and takes up such subjects as sizing ingredients (flours, softeners, deliquescent substances); Size preparations (Chloride of Zinc, Whitening material, Percentage of size, etc.); Fermentation; Mixing; Construction of Sizing Machine; Working of the Machine; Definition of Technical Terms; Calculation, etc. Price $1.00.

Ornamental Design for Woven Fabrics, by Stephenson & Suddards. 273 pages, 66 illustrations.

This is a text book dealing with ornamental design for woven fabrics, for the use of the student, and has been written for the purpose of suggesting helpful ideas to designers and manufacturers of textiles, and aims at bringing artistic textile work into practical touch and closer relationship with the technical requirements of manufacturing. It takes up such subjects as Geometric Design; How to Plan an All-over Repeating Design; The Drop Pattern; The Sateen Arrangements; Borders, Corners, Stripes; The Structure of Ornamental Flowers, Foliage, etc. Price $2.50.

Cotton Spinning. By W. S. Taggart Three volumes. Price $7.50.

This work treats of the subject in an exhaustive way, from the first operations in the picking, to the last in the spinning department. The various parts of the subject have been treated in such a manner that the young student may greatly benefit himself and use it as a text-book, while the older readers will find in them much of interest, in satisfying a desire for a fuller knowledge and a more perfect grasp of the principles underlying many of the processes in much of the mechanism of cotton spinning machinery. A spinner can make no mistake in procuring this work.

The Student's Cotton Spinning, by Joseph Nasmith.

This is a standard book on spinning. It treats of mixing, opening, scutching, carding, card clothing, combing, roving, spinning, reeling, waste spinning, etc. 593 pages. Price $3.00.

Cotton Weaving and Designing, by John R. Taylor, 288 pages, fully illustrated.

This work is by a well known writer and lecturer on this subject, and treats of such topics as: Hand and Power Looms; Drop and Circular Box Looms; Dobbies; Jacquard and Leno Weaving; Terry Looms; Principles of Designing, Plain and Figured; and Textile Calculations. This work is of much value. Price $2.50.

Woolen Spinning, by Charles Vickerman.

This is a most excellent work for students in textile schools, and for skillful, practical men in woolen mills. It takes up the principles that underlie the various processes and operations of the earlier parts of manufacture. It has chapters devoted to Wool; Wool Sorting; Scouring; Bleaching; Mixing, etc., Carding and Spinning. 352 pages. Price $1.75.

Jacquard Weaving and Designing, by T. F. Bell. 300 pages. Fully illustrated.

The contents of this work have been derived from a long course of art and technical training, together with a lengthy practical experience in textile manufacturing and designing, by the author. The descriptions are as concise as is compatible with fairly clear explanation. Price $3.00.

The Mechanism of Weaving, by T. W. Fox.

A treatise of 464 pages, presenting exact and practical information upon the principles of weaving. Takes up such topics as Harnesses; Shedding; Dobbies; Jacquards; Card Cutting; Picking; Pickers; Swivel Weaving; Beating Up; The Reed; Taking-up Motion; Temples; Trimming and Fixing of Parts. 256 illustrations. Price $2.50.

Manual of Dyeing, by Knecht, Rawson and Loewenthal. In three volumes.

Decidedly the best work of the kind for a proper understanding of the present state of the art of dyeing, for the use of practical dyers, manufacturers and students. It takes up such subjects as, Water; Acids; Alkalies; Mordants; Natural and Artificial Coloring Matter; Machinery used for dyeing, etc. Has numerous illustrations and specimens of dyed fabrics. Price $15.00.

Draw Frames and Fly Frames. By Thomas Thornley, 380 pages.

This is the only work especially devoted to the drawing and roving processes, and is intended to benefit those who are directly concerned in the practical operation of the machines under discussion, with particular stress on the points which will give the best results from machines in their actual manipulation. Among the subjects treated may be mentioned the following: Drawing Frames; Fly Frames—Winding, Building Motion, Differential Motions; Roller Setting and Drawing; Defective Roving Bobbins; How to Put up Frames; etc. Price $2.25.

Cotton. By Christopher P. Brooks, 384 pages, 174 illustrations.

This is the most acceptable book on this subject that has been published. The subject has been presented in a remarkably attractive style, and is treated in a manner not to be found elsewhere. Cotton is considered in its botanical features, its cultivation, preparation for the market, and as an article of commerce. A full chapter is given on the commercial uses of the seed for oil, etc. It is a volume that will be of interest to the cotton factor, merchant, broker, and all whose business it is to buy or sell the fibre in its raw or manufactured condition. We cannot speak in too flattering praise regarding the merits of this book. Price $3.00.

Facts and Gossip.

—*Massachusetts, Collinsville. At a meeting of the stockholders of the Collins Mills, which was held recently, it was voted unanimously to sell the plant to the American Woolen Co., the new trust.

—Massachusetts, Mansfield. James Crossley is said to have purchased the Mansfield Print Works formerly operated by James Lind.

—Massachusetts, Maynard. The Assabet Manufacturing Company's plant has been purchased by the American Woolen Company.

—*Massachusetts, Millbury. In one of our recent issues we mentioned the dissolution of partnership between Walter L. Whitney and Daniel MacDuff, who had been doing business under the firm name of Whitney, MacDuff & Co. We then said that Walter L. Whitney would carry on the business of the company, and we are now informed that the new firm will be known as the West End Thread Co.

—Massachusetts, New Bedford. Holden, Leonard & Co. have purchased the Oneko Mills. This is a 12 set mill.

—Massachusetts, South Groveland. The Groveland Woolen Mills, owned by Veasey & Hale, have started work in full for the first time in several years.

—*Massachusetts, South Hadley Falls. The Glasgow Manufacturing Company has not yet started up, as the directors have not succeeded in securing the $50,000 necessary for the working capital. As soon as this amount can be raised, the mills will be put in operation.

—Massachusetts, Westvale. It is reported that the Damondale Mills, which have been idle for over a year, have been sold to a company who will use the buildings for the manufacture of rubber goods.

—*New Hampshire, Guild. The Granite State Mills are to be started up about May 1 by the firm of Fairbanks and Dorr. This is a new concern. The partners are G. A. Fairbanks and George A. Dorr. This is not the same Mr. Fairbanks who was formerly connected with the concern. The product will be twills and repellents. The equipment will be 4 sets, 40 looms; water power, employing about 65 hands.

—New Jersey, Dover. The plant of the Sawyer Woolen Mills has been sold to the American Woolen Company of New York.

—*New Jersey, Passaic. Mr. Lowe, secretary of the Dundee Woolen Company, has been appointed receiver of the Robertsford Worsted Mills.

—New York, Buffalo. There is some talk of the erection of a large cotton mill here, to operate at least 40,000 spindles. Dwyer & Son, mechanical engineers, of Fall River, Mass, have been consulting with the business men of Buffalo in regard to the project, but nothing definite has been settled. It will be remembered there was a similar project for Depew (near Buffalo) several years ago, in which Jos. McCreery was interested.

—New York, Carlstadt. Sharg Brothers, silk manufacturers, have removed their plant from Homestead, N. J., to this city.

—New York, Hudson. The Hudson Fibre Co., a concern which has been owned and operated by Henry Hudson, has been incorporated with a capital of $25,000. The incorporators are Henry Hudson, C. H. Hudson and Annie Hudson, all of Hudson.

—New York, North Hoosick. Henry Watt, of Cohoes, who recently started the Swatling Mill at that place, has given up that mill and accepted the superintendency of the Glasgow Knitting Co. at North Hoosick.

—New York, Troy. Joseph Murphy has severed his connection with the Troy Knitting Co., and will give his attention to the United Waste Co., of which he is treasurer.

—North Carolina, Albermarle. It is announced that knitting machines giving a total output of 150 dozen a day will be installed in the Wiscasset Cotton Mills. It is said that this is an experiment on the part of another firm to test whether such an institution will pay or not. We have not been informed as to who the other parties are, but should the experiment succeed, they will probably locate a knitting mill here.

—North Carolina, Charlotte. The Charlotte Machine Company is winding up its affairs, and will go out of business. This company has been the selling agents of the Pettee Machine Works since 1893, and also of the Saco & Pettee Machine Shops after the consolidation of the two firms. A. H. Washburn, former general manager of the Charlotte Machine Company, who recently resigned his position, has been appointed the Southern agent for the Saco & Pettee Machine Shops, and will use the office and show rooms of the Charlotte Machine Company.

—*North Carolina, Concord. The mill formerly owned by the G. W. Paterson Manufacturing Company, which was recently purchased by James W. Cannon, has been renamed again. As we reported last week, it was entitled the Ealabala Cotton Mills, which has now been shortened to the Bala Cotton Mills. The mills have been incorporated with a capital stock of $6500, with the privilege of increasing it to $100,000. The head office will be at Patterson's Mills, N. C. The incorporators are: J. W. Cannon, D. F. Cannon and E. C. Barnhardt.

—*North Carolina, Fayetteville. The erection of the silk mill for the Ashley & Bailey Company, of Paterson, N. J., has commenced.

—*North Carolina, Fayetteville. The Tolar & Hart Cotton Spinning Mills have been chartered with a capital stock of $100,000. The following are the incorporators: E. H. Williamson, W. L. Holt, J. R. Tolar, J. R. Tolar, Jr., and J. H. Hart.

—Pennsylvania, Chester. The firm of Shaw, Esrey & Co., Ltd., has been dissolved in order to settle the estate of the late D. E. Esrey. A new concern has been organized, to be known as the Esrey Manufacturing Co., Ltd. C. Sumner Esrey is president; Charles W. Andrew, vice-president and general manager, and William H. Esrey, treasurer. The management is practically the same as the old concern, and there will be no interruption in the work of the large plant, which is only closed down for a few days to take account of stock.

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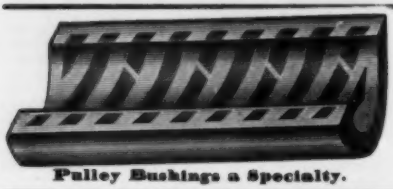
INDIA ALKALI WORKS, Boston.



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Is the only proper method of cloth sponging, and the only firm making a specialty of this work is the
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Goods refinished, brushed, sheared and pressed. Damages in goods or garments made perfect by expert needle-women.

GIBSON'S RECIPES.

Mrs. Gibson has consigned to us for sale all the original books of recipes with samples attached prepared and used by Richard Gibson, covering the entire period of his long career in the dyehouse as one of the foremost American dyers. Some of the recipes are doubtless very valuable. There are several large books and a number of smaller ones, papers, memorands, etc. Mrs. Gibson thinks she ought to get $100 for the lot. We think so too. The sample books, etc. may be examined at our office by interested parties. The entire amount goes to Mrs. Gibson. She informs us that there are no more copies of her husband's printed books to be had.

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Would like to secure part or entire machinery for 5,000 spindle cotton mill; second hand, of standard make; must not be over three years old. Correspond immediately with "South", Box 57, Macon, Ga.

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Knitting Machinery Wanted.

We want one each of 9, 10, 11, 12 and 13 inch underwear machines of standard make, cut 10 needles to the inch and in good condition. Address Muskegon Knitting Mills, Muskegon, Mich.

Facts and Gossip.

—*North Carolina, Salisbury. The Salisbury Hosiery Mills, which were recently destroyed by fire, will be rebuilt, but, it is said, not by the same set of stockholders. W. L. Kluttz is president of the new company and S. H. Wiley, treasurer and agent. About 50 machines and 700 spindles will be installed at the outset.

—*North Carolina, Shelby. L. M. Hull, whom we reported in our issue of March 17th was desirous of locating a cotton mill here, is said to be also considering the establishing of a knitting mill.

—Pennsylvania, Bridgeport. We hear that the machinery in the Sterling Mill will be changed to manufacture carpet yarns. The mills have up to now manufactured cassimeres and operated a plant of 2500 spindles, five sets, 80 looms; steam and dye house.

—*Pennsylvania, Hawley. The United States Knitting Mills, which made an assignment last December, have been sold at sheriff's sale to George Simons of Lake Ariel, for $8625.

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May be had at points on Southern Railway

Steady and remarkable success has attended the mills located on the Southern. It is the great Textile Line of the South. Mill Men and Mill Investors should investigate the advantages our districts afford.

We have now a number of excellent points for new Cotton Mills, or for Knitting Mills, where local capital will join with that from the North in new enterprises. If you are interested, write us.

M. V. RICHARDS,
Land and Industrial Agent, Southern Railway,
WASHINGTON, D. C.

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run the lines of the Illinois Central Railroad and the Yazoo & Mississippi Valley Railroad, reaching into the eleven States of

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Minnesota	Tennessee
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Presenting an unequaled territory for diversified industries, and possessing

Fine Sites for New Mills
Best of Freight Facilities—Coal Fields
Close Proximity to Distributing Centres
Intelligent Help of all Kinds
Many Kinds of Raw Material

To sound industries substantial inducements will be given by many of the places concisely described in the pamphlet "100 Cities and Towns Wanting Industries." Write for a copy. Nearly all kinds of industries are wanted. Very liberal inducements are offered **Textile Industries** in the South by a number of good places. GEORGE C. POWER, Industrial Commissioner I. C. R. R. Co., Chicago.

SITUATIONS WANTED.

The advertisers in the following columns should be addressed in care of TEXTILE WORLD or inquiries concerning them may be addressed directly to "Information Department, TEXTILE WORLD," as full particulars of each advertiser are on file, and the addresses of suitable agents, superintendents and foremen for every branch of the textile industry will be furnished to manufacturers.

Any subscriber may file his application, and no charge is made until position is secured.

The business of this department is held strictly confidential.

The applications of good overseers in every department, who are in want of positions, are solicited.

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A member of the firm is in charge of this department, and gives personal attention to each case.

WOOLEN SUPERINTENDENTS.

218 **Woolen Superintendent,** Designer or Boss Weaver. Age 35; American. Has worked on all classes of dress goods and men's wear. Can furnish good references, and will accept a moderate salary.

1386 **Woolen Superintendent or** Boss Carder. Age 43; American. Familiar with the manufacture of all kinds of woolen goods, is well recommended, and can go immediately.

1490 **Superintendent** Age 37; German. Has worked on plain and fancy worsteds, cotton worsted, all woolen mixes and mixed cassimeres. 14 years' experience in this country.

1485 **Superintendent or Assistant.** Is acquainted with the manufacture of all kinds of heavy woolens and all makes of machinery. Age 35; English. Good references from England and this country.

1454 **Superintendent, Manager or** Designer. Has worked on worsteds, cassimeres and cheviots. Is Scotch, but has worked a number of years in this country and in Canada. Good references.

1537 **Woolen Superintendent, De**signer or Weaver. Has worked on all classes of woolens, worsteds, cotton worsteds, fancy cassimeres, etc., and is acquainted with all Eastern makes of machinery American. Age 34; married.

1398 **Woolen Superintendent or De**signer of recognized ability and at present employed as a superintendent of 36 set woolen and worsted mill. He finds it necessary to remove from New Jersey on account of his wife's health. His past record is first-class and this is an unusual opportunity to secure the services of a first-class superintendent.

1387 **Woolen Superintendent,** one who has had a thorough practical experience in setting up and operating woolen mills. Would take charge of small mill or finishing department in large mill. Now employed but wishes to change. Correspondence solicited.

1465 **Superintendent or Manager** o. carpet mill manufacturing tapestries, Brussels, velvet, Axminster or Moquette carpets. Age 41; married; American. Is at present in the wholesale and retail carpet business, but has had 18 years' experience in the manufacture of Axminster and Moquette carpets, from spinner to superintendent. Is at present employed, but can take position immediately. Wishes to obtain engagement for at least two years, to start. Can furnish excellent references.

COTTON SUPERINTENDENTS.

1539 **Superintendent or Agent.** Age 43; married. Has worked on all classes of linen and cotton goods, plain and fancy. At present manager of a large mill, but can leave at one months notice.

1532 **Superintendent.** Has been in mill business all his life, and been with the present firm for a number of years, having been promoted several times He wishes to better himself.

1337 **Manager or Superintendent.** Thoroughly understands manufacture of book binders' cloth, embossing, starching and calendering. 23 years with Wilson & Bently, London, England. English and American references.

1432 **Desires Position as Superin**tendent of cotton mill, or would take overseer of carding in large mill, where good wages can be secured. Age 30; married.

1236 **Supt. of Cotton Mill** desires to change position. Is thoroughly competent, steady and reliable. Good mechanic, manager, push and executive ability. Over 15 years experience, and fully understands how to keep production right as to quantity, quality, and lowest cost. Best system of economy maintained. First-class references can be given.

1464 **Superintendent of Fancy Cot**ton Weaving. Age 43; married; an American. Will not work outside Northern and Eastern states. Has worked on fancy goods of all kinds, white and colored cottons, worsteds and silks. Is familiar with all makes of looms and dobby heads. Is at present employed, but wishes to better himself, if possible. Refers to present and past employers.

1453 **Superintendent** desires position in a cotton mill Age 26; married; American. Has worked on prints, fine sateens, sheeting ginghams, duck, denims, cottonades, ticks, awnings and domets. Is familiar with all makes of spinning, spooling and warping machinery. At present employed, but wishes to obtain a more advanced position. Refers to present and past employers.

1390 **Cotton Superintendent.** Especially qualified for a mill making dress goods and fine shirtings. Experience with first-class mills as designer and manager. A young man of high character. At present employed.

1486 **Superintendent** or will take a position as boss spinner in a large room. Age 43; American. Experienced mostly on plain goods. At present employed as overseer.

WOOLEN CARDERS.

1501 **Boss Carder on Woolen or** Knit Goods. Age 29; American. Has worked on percentages and all wool goods. Was 11 years with one firm as second-hand and boss carder.

1529 **Boss Carder or Spinner,** on woolen or knit goods. Scotch; age 48; married. Has worked on flannels, cassimeres and hosiery. Good references.

1523 **Boss Carder** Age 29; married; American. Experienced on shoddy, wool, cotton mixes and silk noils. Has been in present position eleven years. Wishes to better himself

1479 **Boss Carder, Second-Hand or** Card Grinder Age 40; American. Can use all makes of American and English cards. Well recommended.

1475 **Wool Carder and Spinner.** Out of work because his mill shut down. An excellent carder and spinner, highly recommended Prefers the West. Will start at moderate salary.

1470 **Boss Woolen Carder.** Experience on great variety of goods: cassimere, beaver, asbestos, wool, cotton and shoddy mixes, also in knitting mill. Well recommended. Age 31, married

1378 **Overseer Woolen Carding.** American, age 32, married. With one mill 13 years, and another 4 years. Excellent references from each. A first-class carder in every way.

COTTON CARDERS.

1366 **Second-Hand Cotton Carder.** Age 30; married. At present employed, but desires to make a change Good references.

423 **Cotton Carder or Supt.** At present in the South but desires to return to the North. Early training and most of his experience was in N. E. mills. Understands combing. Age 38. Married

1403 **Cotton Carder** with 17 years experience in N. E. mills as overseer and second-hand, now in the South but wants to return North. Has never worked for less than $3.00 but would take $2.50 to change. Married. Age 38. Best of references.

1469 **Cotton Carder and Spinner.** Has had charge of both in good mills. Excellent references. Age 37, married.

1339 **Cotton Carder,** young man holding first-class position in New York State, would like position in Eastern or Middle States as assistant superintendent or boss carder paying $5.00 or more a day. Is worth that salary; experience and references of the best.

1535 **Second-Hand Carding, or** Speeder Fixer. Age 41; American. Is a first class man, and thoroughly acquainted with every detail of his work. At present employed, but can leave on very short notice. Prefers to obtain work in New England States

1260 **Young Man** who has worked up through carding rooms of some of the best mills in New England, wants position as overseer in New England or Middle States. Age 27. Not married

0000 **Second Hand Carder** wants position in card room of large mill. 26 years old; unmarried. Thoroughly practical and can give best of references. Address: S. B. Blair, Toccoa, Ga.

WOOLEN SPINNERS.

1461 **Spinner, on Cotton or Wool.** Age 33; married; French. Has worked in one of the best thread works in this country, also in Alsace-Lorraine, on yarns from 70s to 160s. Is familiar with Dobson & Barlow machines and Schlumberger mules.

1299 Woolen Spinner who has had experience as second-hand would like a position as boss spinner. Would accept small salary to start. Has worked on cloakings, dress goods and Scotch tweeds in New England mill.

1276 **Spinner,** woolen. Wool and shoddy from 1-2 to 10 run, cassimeres, flannels, dress goods, underwear and blankets. Davis & Furber, Furbush & Sons, Johnson & Basset, and Schmidt machinery. Good references.

1493 **Boss Spinner.** Age 25; unmarried; German. Has worked on cassimeres, cheviots, stockinets, satinets and camel hair goods. Can operate American mules, and has worked for several years in American mills, to which he refers.

1503 **Boss Spinner.** Age 38. Has worked on kerseys, meltons, cloakings, dress goods, carpet yarns, etc. Good references.

COTTON SPINNERS.

1519 **Overseer Spinning** Age 31; American; married. Has worked on yarns from one run to 5¼. Will accept an average salary. At present employed, but wishes to better himself.

1507 **Mule Overseer** English. Age 30; married. Acquainted with all makes of machinery, English and American. Is a practical mule man, competent and reliable. Can figure on any mule, all the way through. Good references.

1424 **Overseer, Spinning.** Mules preferred. At present employed. Has held position as overseer 6 years. Single. Will go anywhere.

1527 **Overseer Ring Spinning, Spooling and Warping.** Age 27; married. At present employed, but wishes to better himself. Can leave his present position in one or two weeks. Prefers to work in the Eastern States.

1498 **Overseer, Mule or Ring Spinning,** Spooling and Warping. English; age 38. Good experience in English and Canadian Mills. Well recommended.

1497 **Overseer of Ring Spinning.** Age 30; French. Experienced on fine and coarse yarn and all grades of cotton. Large experience and well recommended.

1502 **Second-Hand Spinning, Spooling** and Warping. Has worked principally on heavy sheetings. Age 30; single. Will go anywhere. Good references.

1504 **Overseer Mule Room.** Age 38; American. At present employed but wishes to better himself. Will not go South.

1471 **Overseer Ring Spinning,** spooling, warping, twisting. 13 years' experience in England and 6 years in this country. White and colored yarns from 5s to 90s. Refers to past employers. Age 38, married.

WOOLEN WEAVERS.

1452 **Boss Weaver, Superintendent,** or Designer. American; age 43; married. Has had 20 years experience on men's wear and ladies' woolen dress goods. Good recommendations from present and former employers. Good manager of help. Wishes to obtain a position where he will receive $4 and upwards per day.

1536 **Boss Weaver or Superintendent.** Age 43; married; American. Can run any department in woolen mill, having been in business for himself. Not at present employed. Can take position immediately.

1468 **First-Class Weaver** on fancy woolens, worsteds and meltons, cotton worsteds and shoddy goods. Can take overseer position after 6 days' notice. Has been loom fixer, boss and superintendent. Age 43. Crompton & Knowles looms.

1413 **Boss Weaver or Designer.** American; age 49. Has worked on beavers, kerseys, dress goods, cassimeres and all kinds of men's wear. Is also a good loom fixer.

COTTON WEAVERS.

1459 **Fancy Cotton Weaving,** Slashing, etc. Age 36; married. Has worked on all kinds of fancy goods and is thoroughly competent in all departments of manufacturing, with the exception of spinning. Understands velvet and corduroy weaving. Is not at present employed and can take a position immediately.

1425 **Overseer, Cotton Weaving.** Age 38. Married. At present employed in large Mass. mill where he has been for 7 years as overseer. Worked on all kinds of goods and is well experienced. American. Refers to past and present employers.

1380 **Overseer Cotton Weaving.** Held overseer's position for 5 years in Mass. mill, but now out because of change in management. A man of well-known ability. Age 48; married, American. One of the best weavers in New England. Will go South to a good position.

1334 **Jacquard and Dobby Weaver** and designer on Knowles machines. 8 years' experience in this position. At present employed and can furnish excellent references. Age 38; married.

1333 **Overseer of Cotton Weaving** with more than 20 years' experience in weave rooms of N. E. and Canadian mills. Experience on all kinds of white and colored, plain and fancy work, except Jacquard, American and English, looms. Married; age 37.

1533 **Overseer Weaving or Superintendent.** American; age 38; married. Has had twelve years experience on all grades of white and colored fancy goods. Would like overseers' position in large weaving room, or on carding.

1235 **Cotton** man wants position as overseer of cotton weaving. Prints, twills, satins, denims, cheviots, lenoes, etc. Crompton, Knowles, Lowell, Whiting and English looms.

1373 **Overseer Cotton Weaving.** A man with especially good opportunities to gain wide experience in large Mass. mills; now second hand, having worked up from band boy. American, age 29, married; best of references.

1247 **Elastic** weaver wants position as overseer. Used to cotton web, elastic suspenders, silk neckwear, dress goods and handkerchiefs. 28.

KNITTERS.

1450 **Foreman or Superintendent of Hosiery.** Age 40; married. Has worked on cut feet, seamless half hose, ladies' and children's hosiery. Is familiar with every standard make of knitting and sewing machines. Is first-class finisher, and can start new plant. Salary moderate. Prefers to go South, if possible. Refers to former and present employers.

1441 **Supt. or Overseer in Hosiery** Mill. Age 49; married. Wishes to obtain a position near Boston. Cannot take a position before January 1st, 1899. Has worked on all classes of knit goods and is familiar with all the leading makes of machinery. Refers to past employers.

1402 **Circular Rib Knitter** now holding position as overseer in N. Y. mill would like to secure better position. Has worked on spring needle and welt work silks, worsteds, cotton, tuck stitch ladies' forms. Can refer to present and past employers. Age 24. American.

1472 **Knitting Mill Superintendent** who has had 11 years' experience as superintendent and machinist. Has practical knowledge of the manufacture of all kinds of knit goods. References from past employers. Age 46, married.

1492 **Boss Knitter.** American; age 25, single. Large experience on ribbed goods. Is acquainted with all makes of knitting machinery. Well recommended.

DYERS.

1531 **Boss Dyer.** American; Age 32; unmarried. Has had a large experience on raw stocks, rags, worsteds, yarns, pieces, cassimeres, kerseys and dress goods. Not at present employed. Can take position immediately.

1505 **Boss Dyer** on all classes of wool, woolen and worsted yarns, cotton warps, indigo, etc. Desires to change to better himself.

1476 **Boss Dyer.** Experience on kerseys, broadcloths, dress goods, cassimeres and worsted piece dyes. Has been in good mills for 3, 5 and 7 years and gave satisfaction. Would start in New England or Central States for $3.00 a day.

1278 **Wool Dyer.** Very successful and reliable and has had large experience. Practical indigo dyer. Can accept position at once. Best of references.

1513 **Boss Dyer.** Age 35; married; English. Has worked on underwear, piece dyes, raw stock and mercerized goods. Is acquainted with all makes of dyeing machinery.

1512 **Boss Dyer.** Age 33; married. Has worked on kerseys, cloakings, worsteds, wool shoddy and yarn. Will go anywhere.

1524 **Boss Dyer.** Age 40; married. Acquainted with indigo, woad and hydro-sulphate vats. Has had a large experience, and is a good man for the position.

1303 **Dyer** with six years' training in Bradford, England, before coming to this country. Has been in several American and Canadian mills and given best satisfaction. A thoroughly practical and up-to-date dyer. Age 32. At present employed, and would accept only first-class position.

1145 **Cotton Dyer,** with many years' experience on chain warps, yarns and threads. Twenty years at last place, where mill has shut down; good habits and highly recommended. Age 50, married.

DESIGNERS.

1509 **Designer, or Boss Dresser,** or will take superintendency of small mill. Age 38; married. Has worked on dress goods, fancy worsteds, cloakings and piece dyes. At present employed as boss carder, but desires to better himself, if possible.

1444 **Designer.** Has made a special study of designing during the past ten years. Wants a position which offers chance for advancement. Has worked on all classes of goods and is familiar with standard makes of machinery. Can fix, set up and has started sections of new fancy looms.

1431 **Woolen Designer or Superintendent.** Young man, at present employed, desires to secure a position as above. Has been assistant superintendent of 18 set mill making fancy cassimeres and worsteds. Single. References show him to be a man of good ability.

1449 **Overseer of Weaving or Designer.** Age 38; married; American. Thoroughly capable. Has designed his own goods for eight years, and studied designing for two years. Left last position on account of sickness, and will take a small salary to start. Has worked on all classes of cottons, plain and fancy, and is acquainted with all makes of machinery. Refers to former employers and others.

1397 **Cotton Designer or Weaver.** A young man with unusual opportunities and experience in England, now holding a position in a leading mill in Connecticut, desires to advance. Refers to several prominent mill men and would make a progressive designer for a mill running on Jacquards, Lappet or Lenos.

FINISHERS.

1526 **Foreman of Finishing Room,** Folding, Packing, etc. Age 45; married; English. Has worked on white and colored goods and prints. Is acquainted with every kind of machinery used in his business. Has worked 11 years in this country. Can give good references.

1534 **Overseer or Second-hand** Woolen Finishing. Age 26, unmarried. Has worked on fancy and piece dyes, broad-cloths, coverts, cassimeres, etc. At present employed, but wishes to better himself. Good references.

1494 **Finisher on Felts,** or will take a position for the making of sizing. Age 26; single. His last position was engineer and in charge of sizing and finishing all classes of felts. Good references.

1499 **Overseer of Finishing.** Age 43; American. Has worked on flannels, cheviots, cassimeres, fine suitings, broadcloth, hair lines, etc; from loom to case. Was 14 years with his last firm to whom he refers.

1257 **Superintendent of Knitting** mill wants position; is a finisher and understands every part of the business, including shipping all kinds of goods, fabrics, cotton, worsteds, silks, wool on all kinds of shapes, and flat goods; most all kinds of knitting machinery and finishing machinery; age 32; married; refers to past record.

1351 **Woolen and Worsted Finisher** with 7 years' experience as overseer in R. I. and N. Y. mills, from which he has excellent references. At present second hand in one of the best worsted mills in N. E. Habits first-class; age 29, married

MISCELLANEOUS.

1538 **Master Mechanic.** Age 41; married; American. Is acquainted with all makes of looms, cards, pickers, frames, etc. At present employed, but wishes to better himself. Refers to present and former employers.

1530 **Boss Dresser.** Age 28; married; English. Has worked on dress goods, fancy worsteds, suitings, cassimeres, etc. Is at present employed, but wishes to obtain a steadier position. Good References.

1518 **Overseer Weaving.** Has worked on colored cotton goods, shirtings, dress goods, duck, heavy sheetings, etc. Age 46; married; American. At present employed. Wishes to better himself. Can leave on two weeks' notice.

1528 **Overseer Dressing Room** Age 38; married; Scotch. Has worked on all classes of goods, from coarse druggets to the finest grade of fancy worsteds, is acquainted with all forms of looms used in dressing. At present employed, but wishes to change his position. Will go anywhere.

1515 **Pay-Master and Shipping** clerk. Will only work in Southern States. Will accept a moderate salary to begin.

1514 **Overseer Twisting, Spooling,** Winding and Reeling. Age 36; married; American. Has been in one position for 17 years. Wishes to better himself. Will go anywhere.

1520 **Overseer on Prints, Sheetings** and Shirtings. Age 32; married. Wishes to obtain a position in the New England States.

1516 **Warper, or in Charge of Spooling.** Age 44; married. Experienced on flannels, blankets, dress goods, cassimeres and carriage cloths. At present out of a position, and will go anywhere.

1525 **Master Mechanic,** in large woolen or cotton mill. Age 40; married; American. Is acquainted with nearly all kinds of textile machinery. At present employed, but can leave on reasonable notice. Will go anywhere. Excellent references.

1510 **Boss Worsted Carder.** Has worked on all classes of worsteds, and mohair alpaca. Is acquainted with all kinds of English and American worsted machines.

1418 **Cloth Hall.** Overseer, shipping clerk or paymaster. Has had a thorough experience in each of the above positions and is familiar with white and colored cotton goods. Is well recommended. Aged 35. Married, and is also a good all around accountant.

1488 **Boss Carpenter or Master Mechanic.** Age 46; American. Is acquainted with all makes of cotton machinery, and is a good man on shafting, wood work, etc. At present employed, but wishes to better himself.

1500 **Overseer of Drawing Room.** Age 31. Has worked on Mohair, camel hair and carpet stock. Familiar with all kinds of foreign and domestic wool Was 14 years in one position and has excellent references.

1451 **Mechanic or Chief Engineer.** Age 37; married; American. A first-class mechanic and engineer. At present employed, but wishes to obtain a position where there is a better chance for advancement. Has been 2½ years in present position as master mechanic, and was previously for 13 years with one firm as department foreman, engineer and master mechanic. Refers to former and present employers.

(Continued from page 141.)

The weavers of worsted cloth are calling for considerable yarn at this time for backing and other purposes. There are some contracts being placed by hosiery mills. The flat-goods mills on cheap work are not doing well at this time on account of the demand for cotton plush underwear. This is particularly so with medium and cheap underwear, and the dealers in noils are suffering in consequence, as these garments formally were the outlet for all kinds of waste. There is another factor in this noil question. The new trust has acquired mills capable of using all the noils which can be furnished by the worsted mills in the trust, and these mills very likely will have no noils for sale.

We note that manufacturers of underwear are beginning to use silk noils, which can be bought for 10 to 20 cents per pound, which is cheaper than wool noils. Of course these noils cannot be used where it is necessary to dye garments.

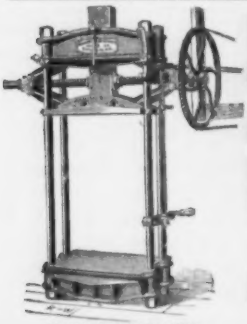
Mills using thread waste extensively, in order to keep established styles to a popular price, talk of using noils next season instead of threads. They will card the noils carefully and then run them through garnetts, getting nearly as good results as from threads for much less money. Many Australian noils will be imported from Europe as the duty is but 20 cents per pound. This is to take the place largely of Australian lambs' wool. The knitters of the better and established lines of underwear are doing fairly well, and we note there is a growing demand for natural black wool tops.

Notwithstanding the fact that the better mills manufacturing underwear are more than holding their own, much complaint is made by manufacturers at the present trend of affairs. Buyers no longer consider quality in purchasing. The best buyers are after finish of garments at a price, rather than quality. So long as the purchaser is humbugged by finish, it matters not if the next day the garment is found by the wearer to be worthless.

—The question of the advantage of cross breeding with sheep is not an absolute but a relative one. It is probably true that there is already in existence as great a variety of families of sheep as will make the selection of a suitable breed possible for any circumstances or climate. If a man has large areas of cheap lands distant from markets he will incline to wool and so will select the Merino. If he has heavy lambs and luxuriant foods and a good market for mutton, he will turn to the Cotswold, Lincoln or Leicester. If he can get good prices for a finer grain of mutton or wants a sheep that will subsist on scantier pasture, he has four or five families of dark faces to choose from. If he is quite close to the tables of flesh connoisseurs he can tempt them with young Dorsets.

—In England the demand for silky mercerized cotton is great. It is apparent that many people in the trade can hardly credit the simple manner in which it is produced. They seem to imagine that the liquors used must be of a very complex character; but such is not the case, and it is quite possible that the nearer they keep to a plain caustic soda liquor of 60 degrees Twaddell strength or thereabouts so much the better. It is quite evident that there is wanted a machine to carry out the process, and in this direction there is room for our inventors, who, however, will find the problem by no means easy to solve. Pending the invention of such a machine we may note that Hummel in his "Dyeing of Textile Fabrics" figures a yarn stretching appliance that will answer the purpose in a satisfactory manner.

—A. L. Shafer, at the annual meeting of the Chambersburg (Pa.) Hosiery Company, was elected superintendent.



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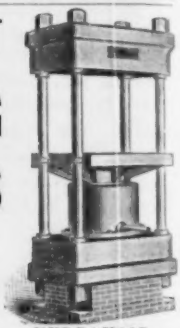

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Fall River, Mass.

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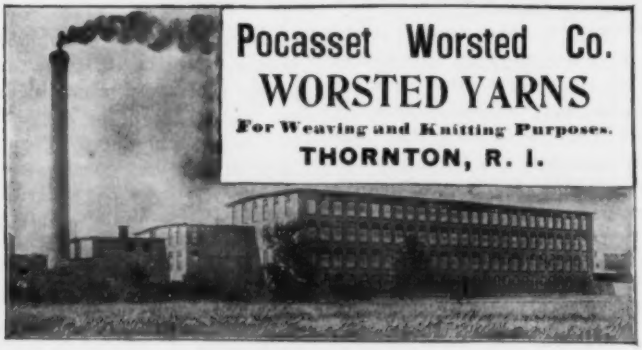
Colored Cotton Yarn

From American Peelers and Egyptian Cottons.

Solids, Mixtures, Bleached, Combed and Carded Egyptians. Cops and Cones.



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For Weaving and Knitting Purposes.

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Knitting and Weaving Yarns

Cones, Cops, Warps, Skeins,
Single, Double, Three-ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.

EDWARD S. HYDE, 223 and 225 Chestnut Street, **Philadelphia, Pa.**

YARN DEPARTMENT.

Eastern Yarn Market.

Cotton Yarn: Spinners in the East continue busy. The light-weight season is nearing an end, and new contracts are being placed for the coming heavy-weight season. On plush underwear the heavy-weight season continues the year round. We hear some complaint and criticism on these garments because there is too much bulk. It is conceded that they are cheaper than wool underwear, but buyers say it makes one think he is clothed like a mummy, so much cotton is necessary to keep the cold out. These garments are undoubtedly giving the spinners both South and East many orders, and are keeping all busy. Prices on the better grades of carded cop yarn are fairly well maintained. On the cheaper grades there is noted a slight falling off. We note that some mills owning property both East and South are abandoning their Eastern mills and propose to locate and operate all machinery in the South. Many of the Eastern mills' employees whose pay has not been raised to a satisfactory point, are striking for higher wages. This is giving the Southern mills an opportunity which they are not slow in availing themselves of. The prices on Southern yarn are slightly lower, and stocks are accumulating in Philadelphia. The weavers are not using much 2/30s and 2/40s for cotton worsteds, as the demand for the latter has fallen off.

Cotton hosiery is quiet, as may be expected at this time of the year, as the heavy-weight lines in both wool and worsted are beginning to be called for.

Fine combed yarn continues in good demand. Knitters expect to run late on this class of yarn and are anxious to have as much of it on hand as possible. The American Thread Co. has taken hold of the fine yarns in combination. This went into operation April 1st, when the trade received a notification, that after that date all orders and all bills must be sent to New York, and the bills coming from New York would state which mill had filled the order; all checks being made out to the American Thread Co. The knitters are anticipating an advance, and many are trying to place orders for next year delivery. The trust, however, will not accept orders so far ahead. The spinners of cotton yarn are, generally speaking, doing a good business.

Worsted Yarn: Spinners are getting few orders. The weaving trade seems to be in a waiting attitude. The light-weight season is soon to open and weavers do not know how the trade will be affected by the workings of the trust. Already the agents of this concern are going among the trade and are telling them to hold off from buying until they open their styles. The trust will open the spring weight May 1st; the balance of the trade will open June 1st. The weavers are not sure how the new order of affairs will work, and thus the buyers are keeping out of the market. Independent weavers say that they are going to run, but just how much they will get out of it is a question. Specialties will run, and on these the weaver expects to get some profit. Many of the mills are keeping out of the trust because they want cash down for their plants. Wools are ranging low, and staple fine wools are beginning to attract the attention of foreign top makers. These wools are being exported to be made into worsteds on the "other side." Over 400,000 pounds were exported during the week ending April 22, with more to follow. This should make buyers realize the low price of

Continued on page 137.)

Frank E. Patterson, Prest. Oscar W. Wood, Treas

GERMANTOWN SPINNING COMPANY INCORPORATED GERMANTOWN JAN. 9TH 1890

Germantown Spinning Co.

COTTON CARDED

HOSIERY YARNS

In numbers from 6s to 26s.

Germantown, Philadelphia.

W. Warren Thread Works,

SPOOL COTTON

on 100 to 12,000 yd. Spools or Tubes.

A Specialty of Thread for Manufacturers Use

on Spools, Tubes or Bobbins.

Also Seaming and Hosiery Yarns

on Cones, Tubes or Skein.

Our bleaching and dyeing facilities are new and unsurpassed for prompt and neat work. Correspondence solicited.

WESTFIELD, MASS.

The Best is the Cheapest.

It is BETTER and CHEAPER to wind yarn by the "Universal" system before shipment from the mill, thus insuring perfect delivery to knitting machines without rewinding.

UNIVERSAL WINDING CO.,

F. H. BISHOP, Manager.

226 Devonshire St., - Boston, Mass.

Continued from page 135.

the domestic article and should convince the timid that now is a good time to purchase yarn. The heavyweight season is still on and is late. The weavers have been busy and are now running full time. Some of the mills on piece dyes are running days of 24 hours, others are running until 9 o'clock at night. The fancy worsteds have been in good request. We note, however, that fewer cotton-worsteds are being sold. These heavyweight fancy worsteds have been made from a 3/8 quality of stock, made into 2/20's to 2/26s. High cost cloth out of Australian is not now in demand, although the trend of European styles is for fine, smooth cloth out of Australian.

Few new orders have been placed for yarn. The spinners running are all on orders taken early in the season, but are buying only little wool on account of the uncertainty caused by the formation of the trust which went into operation April 17. Considerable mohair yarn is being ordered for plushes and dress goods. The manufacturers of braid are well filled with orders, but a change is looked for, as the use of braid for dresses is going out of style. The Rockville mills—some of them—are still on government work, but the finest cloth mills are not running full time. There is an uneasiness on the part of help, and already mills are being asked by their operatives for an advance in wages.

Bunting is being sold fairly well. Last year mills on such fabrics made much money, having advanced in price over 100 per cent., caused by the patriotic demand. Manufacturers state that more money would have been made had the other mills, not equipped to manufacture bunting, staid out of the business. These latter mills lost money, because of their inability to produce the proper thing. Large sales of tops have been made in lustre, ¼ and ⅜ blood, to dress

(Continued on page 139.)

CATLIN & CO.,
YARNS.
67 Chauncy St., Boston
316 Church St., New York.
206 Chestnut St., Philadelphia.

Walcott & Campbell Spinning Co,
IROQUOIS MILLS.
FANCY HOSIERY YARNS
IN ALL COLORS.
New York Mills, Oneida Co., N. Y.

JAMES E. MITCHELL & CO.,
Commission Merchants.
122 & 124 Chestnut St., Philadelpia, Pa.
6 & 8 Summer St., Boston.
Cotton, Woolen & Worsted Yarns.
All numbers on Hand and Made to Order.

COTTON WARPS
White or Colored.
Toweling and Grain Bags.
Dana Warp Mill,
WESTBROOK, MAINE.

TUCKER & COOK MFG. CO
MANUFACTURERS OF
WHITE AND COLORED COTTON **WARPS**
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

GRANT YARN CO.,
COMBED AND CARDED COTTON
YARNS 40s and above. AND
FITCHBURG, MASS. **WARPS**

E. JENCKES MFG. CO.
Colored Cotton, Hosiery, Woolen and Merino **YARNS**
PAWTUCKET, R. I.

LINEN YARN IMPORTER.
Hughes Fawcett, 115 Franklin St., New York,
Flax, Hemp & Jute Line and Tow Yarns,
FOR WEAVING PURPOSES
Linen Jacquard Harness Twines.
Fine Cotton Harness and Heddle Twines.
For Cotton, Silk, Woolen and Carpet manufacturers. Correspondence solicited. Samples promptly furnished.

CAPACITY, 50,000 Spindles.

ORSWELL MILLS

FITCHBURG MASS.

COMBED OR CARDED

COTTON YARNS

In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

The J. R. MONTGOMERY CO.,

WINDSOR LOCKS, CONN.

MERCERIZED EGYPTIAN COTTON SPINNING BANDS.

We claim for them

- They will not shrink nor stretch.
- Are not affected by dry or humid atmosphere.
- Are Fifty per cent. stronger than ordinary bands.
- Will last twice as long.
- Less power required to run spinning.

Mercerized Cotton Yarns which give the High Silk-Like Luster.

PLAIN AND FANCY PATTERN

Cotton Warps,

WHITE, MIXED AND COLORED.

For SATINETS, BLANKETS, ETC.

WHITTIER COTTON MILLS,

LOWELL, MASS.

INDIAN ORCHARD COMPANY,

Indian Orchard, Mass.

Manufacturers of - - - -

COTTON WARPS AND YARNS

In gray and all colors, single or in any twist.

COLORED COTTON

Machined, Carded or in Roving.

NOVELTY YARNS

In Cotton, Mercerized Cotton, Silk and Worsted, in various Patterns, Colors and Twists.
We are always pleased to assist our patrons of the Woolen Goods manufacture in special pattern warps for samples.
We use a uniform grade of long stapled cotton in all our manufacture.

(Continued from page 137.)

goods manufacturers. Prices have been low on this class of stock. Spinners owning tops have sold at prices under those prevailing during the free trade period. The astrachan trade is beginning to improve for the cheaper class of cloth. The Philadelphia mills are doing best on this. The knitters of the better class of sweaters have more business than can be handled. The medium and cheaper grades are not running so well, as this class of trade is always dull at this time of the year.

French spun yarn is selling fairly well. Orders were placed for this yarn last September and October. Knitters were desirous of covering themselves, not knowing what the outcome of the present year would be; but, it is undoubtedly a fact that had they waited they would have purchased their yarn at a lower price. These yarns will be delivered either next month or in June. Prices on all yarns are nominal, with a lower tendency.

We quote prices on worsted yarns as follows:

2/50s Australian	$1.02 to $1.05
2/40s half delaine, half Australian	.90 to .92½
2/40s half blood	.80 to .82½
2/30s half blood.....	.70 to .76
2/36s ⅜ blood	.70 to .72
2/30s ⅜ blood	.58 to .65
2/14s ¼ blood	.50 to .52

Woolen Yarn: Spinners are getting more orders for yarn and are fairly busy. Orders have been placed in fair amounts for hosiery yarns, although it is noted that much of the orders placed have been merino—part wool, part Peruvian cotton. We also note in this connection that the demand for hosiery is coming for yarn which gives a smooth finish, which necessarily requires a larger quantity of slubbing or top waste in order to get the desired worsted finish. It is undoubtedly a fact that hosiery is in greater demand than are other knitted fabrics. The trade is opening late for merino or woolen hosiery, but or-

(Continued on page 141.)

Colchester Mills,
SPINNERS OF
Made from Colchester Mills Sanitary Random Yarn
Mule Spun Cotton
Hosiery Yarns.
Sales in Charge of A. D. SALKELD, 86 & 88 Franklin St., NEW YORK.
Representing B. B. Smalley, Thos. F. Patterson, F. E. Snow
Receivers Colchester Mills.

WOOLEN AND MERINO YARNS.
Special line for Bicycle and Golf Goods in all shades
For Hosiery, Gloves, Underwear, and all kinds Knit Goods. Cop, Cone and Skeins.
The J. & H. Clasgens Co.
New Richmond, O.

WOOLEN YARNS.
All grades Woolen, Mixed and Merino yarns.
15 SETS CARDS.
EDWARD M. ROCKWELL,
LEOMINSTER. · MASS.

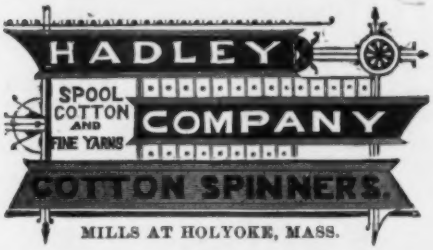
A. HERBST. J. W. JONES
HERBST & JONES,
KENNEBEC WORSTED MILLS.
Successors to Kershaw Worsted Co.
WORSTED YARN SPINNERS,
21st & Naudain Streets,
PHILADELPHIA.

ALBERT R. ELSASSER,
Clifton Worsted Mills,
WORSTED YARNS.
Lustre Worsted a Specialty.
Mills: Addingham, Del. Co., Pa.

C. MOORE & CO.,
MANUFACTURERS OF
TWINES, THREADS AND YARNS.
Jacquard Harness Twines of all kinds on hand and made to order.
S.W. COR. FIFTH & MARKET STS.,
Philadelphia.

EICHMANN & STERNBERG
530 Broadway cor. Spring St., NEW YORK.
Plain and Gassed Cotton Yarns,
HOSIERY COTTON YARNS,
Mercerized Cotton Yarns. Harness Twines.

Cohannet Mills,
TAUNTON, MASS.
Spinners of High Grade
HOSIERY YARNS OF EVERY DESCRIPTION.
Selling Agents JAMES E. MITCHELL & CO., Philadelphia and Boston.



SPINNERS OF
FINE COTTON YARNS
30s TO 100s.
Gray, Bleached, or Colored. On cop, in skein on spools, cones or tubes.
Fine Cotton Warps, single and two-ply, in chain, etc.
Spool Cotton and Seaming Thread.
95 Milk St., BOSTON.

THE WILLIAM CLARK COMPANY,
WESTERLY, R. I.
Mills equipped with the latest and most improved machinery.
Combed Egyptian from No. 20s to 100s. Combed Sea Island from No. 40s to 200s.
Also 2, 3, 4, 5 ply and 6, 9 and 12 ply cable laid.
Hosiery Yarns on Cops Tubes or in Skeins, Grey, Bleached or Dyed. (Fast Colors.

MONUMENT MILLS,
Manufacturers of
White, Colored, Fancy and Double and Twist,
COTTON WARPS
HOUSATONIC, MASS. 4s to 60s.

GREENE & DANIELS MFG. CO.,
COMBED, CARDED AND GASSED
Yarns, Threads, Twines and Chain Warps,
Colored and Bleached Yarns Furnished in any manner desired by the trade. **PAWTUCKET, R.I.**

Established 1849.

CARRIAGE CLOTHS.
LIVERY CLOTHS.

ACCOUNTS SOLICITED.
Broad Cloths, Sackings,
Cotton Warps, Whip Cords.
C. Coles Dusenbury & Son,
396 & 398 Broadway, N. Y. City.

HAYES, O. H. & CO.
Representative Lines of Woolens
O. H. HAYES & CO.
Liberal arrangements made with manufacturers or men controlling mills' productions.

(Continued from page 139.)

ders received have greatly encouraged manufacturers. There is also a growing demand for French flannels, which is the latest fad, both for men and women, and orders are being largely placed with the mills for the finest Australian in 6½ to 7-run yarn. These flannels are used in high colors —blue, pink, purple and scarlet. Mills which have been doing badly for three years are now running full on this class of cloth, and when the demand comes for their regular lines, will have more work than they can well handle.

(Continued on page 133)

Philadelphia Yarn Market.

We have to report rather dull trade, with plenty of yarn offering. This condition prevents any present advance in prices. Some lines are rather in buyers favor today, although cotton is still considerably higher than last fall's prices.

Southern knitting yarns are at about a stand still, although weaving yarns have advanced somewhat from their extremely low figures.

Worsted trade is fairly busy and most spinners are well sold up for some time ahead.

Woolen and merino yarns are in somewhat better demand. Most users of these goods, however, spin their own yarn, so spinners for the market, are generally dull. We quote:

Warps:

20s	12½ to 13
22s	13 to 13½
26s	13½ to 13¾
12/2	12¾ to 13
14/2	13
16/2	13½
20/2	13½ to 14
30/2	16
40/2	21 to 22

(Continued on page 143.)

FRENCH AND BRADFORD SYSTEMS

B. F. BOYER & Co.,

WORSTED YARNS

IN WHITE AND MIXES.

Woolen and MerinoYarns

OFFICE AND MILL
Delaware and Cooper Sts.

Camden. N. J.

Eddy & Street,

COTTON, YARNS WORSTED,
WOOLEN, AND SPUN SILK.
BRAIDS

PROVIDENCE, R. I.

WAVERLY WORSTED CO.

SPINNERS OF

WORSTED YARNS

FOR WEAVING AND KNITTING.

Main St. & Green Lane, Manayunk. Philadelphia.

RICHARD CAMPION,

Selling Agent for—

Bristol Worsted Mills,
Highland Worsted Mills.

17 Bank Street, Philadelphia, Pa.

WE BUY FOR CASH!

ODD LOTS OF

YARNS AND WARPS

ENOS CROSLAND'S SONS,

Haverford Ave. and 69th St., PHILA., PA.

DANIEL S. PRATT,

180 Summer Street, - BOSTON,

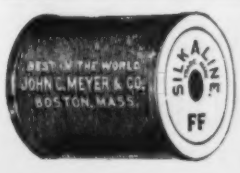
ROOM 24.

851 Calle Piedad, Buenos Aires.

SOUTH AMERICAN WOOLS,

..Personally Selected..

Graded to the Standard of U. S. Markets.



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MEYER SILKAKINE

Made in all sizes and colors.

Also manufacturers of high grade spool Threads and Silks. Samples and prices gladly furnished, free of charge, upon application.

87 SUMMER STREET, cor. Kingston, BOSTON.

Tel. 515 Oxford.

HOWLAND CROFT, SONS & CO.

LINDEN WORSTED MILLS.

Fine Worsted Yarns

OFFICE AND MILLS:

Broadway and Jefferson Ave., Camden, N. J.

Represented by FIRTH BROADHEAD,
937 Bullitt Building, Providence, R. I.

ALLEGHENY WORSTED MILLS,

Thomas Wolstenholme, Sons & Co., MANFRS. OF

Worsted YARNS,

ALL NUMBERS SINGLE AND TWO-PLY,

Sell Direct,

on Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural & Fancy Mixes

Office and Mills: Frankford Ave. and Westmoreland St., Phila., Pa.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—white or colors, in skeins, on spools, cones, or shuttle bobbins.

NOVELTY YARNS—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making Yarns only.

CENAPPED YARNS of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

BRISTOL, R. I.

George Campbell & Co.

Worsted Spinners,

Yarns, both French System and Bradford.

Knitting Yarns in all Grades and Mixes.
All Numbers to 60s.

21ST STREET AND WASHINGTON AVENUE, PHILADELPHIA.

MALCOLM MILLS CO.,

MANUFACTURERS OF

Novelty Yarns, Silk Noil Yarns, in Fast Colors AND White.

Mills, Frankford, Pa. Office, 239 CHESTNUT ST., PHILA.

(Continued from page 141.)

Skein:

20s soft	12¼ to 13
19s	12¼ to 13
26s	12¼ to 13
4s to 10s	11 to 11¼
12/2	11½ to 12
14/2	12
20/2	13¼ to 13½
30/2	15½
40/2	20 to 22
8/3 hard	10¾ to 11
16/3	12½ to 13
16/2 slack	12½ to 13
16/4 slack	12½ to 13

Southern cones (various qualities.)

6s to 8s	11 to 12
10s	11½ to 12½
12s	12½ to 13
14s	13 to 13½
16s	13½ to 14
20s	14 to 14½
22s	14½ to 15
24s	14½ to 15¼
26s	15 to 16
30s	16½

Shuttle Cops:

6s to 8s	11½ to 12
12s	12 to 12½
16s	12½ to 13
26s	13 to 13½
40s	16½ to 17¼

Mixed Colored Cones:

6s to 8s	13 to 13½
10s	13½ to 14
12s	14 to 14½
14s	14½
16s	15 to 15½

Eastern Cops:

10s hosiery	12¼ to 13
14s	13½ to 14
16s	14 to 14½
20s	15 to 16
10s shuttle	13 to 13½
14s	13½ to 14

Eastern skein, ½ cent above cops.

Eastern cones, 1 cent to 1½ cent above cops.

Universal wound cones, ½ cent extra.

Egyptian, carded, 5 to 6 cents above white.

Combed yarn, 5 to 6 cents above carded.

Wool spun cotton yarn very dull. Prices nominal. We quote:

20 cut black cops	13
26s " "	15½ to 16
12 " "	12¼ to 13
16s " "	12¼ to 13

SILK NOILS AND SILK NOIL YARNS
IN WHITE AND COLORS.
MOHAIR LOOPS, KNOTS, AND FANCY YARNS FOR DRESS GOODS AND CLOAKINGS.
A. T. SKERRY & CO., 47 LEONARD ST., NEW YORK.

YARNS
SOLIS : : BOSTON.
179 Devonshire Street.
ANDREW J. SOLIS, Jr. & CO.

Incorporated 1899.
AMERICAN
Cotton Yarn Exchange
COMBED AND CARDED COTTON YARNS
From Northern and Southern Mills.
American, Egyptian, Peruvian and Sea Islands.
ARNOLD B. SANFORD, Pres. and Gen. Mgr.
45 Milk Street,
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Long Distance Telephone, Boston 1100.

CHENEY BROTHERS,

SILK MANUFACTURERS.

ALL KINDS OF

Knitting Silks, Ribbons AND Piece Silks,

USED FOR TRIMMING KNIT GOODS.

TRAMS, ORGANZINES and SPUN SILKS, in the Hank, or on Spools or Cones, for Manufacturers' Use. Silk for Special Purposes Made to Order.

MILLS: South Manchester and Hartford, Conn.

SALESROOMS: 477, 479 and 481 Broome Street, NEW YORK.
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79 Chauncy Street, BOSTON.
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Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Foreign and domestic

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Importers of European and Asiatic Raw Silk.

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DYE and BLEACH WORKS,

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DYERS of Cotton, Cotton Yarns, Wool and Raw Stock Generally. **BLEACHERS** of Cotton and Cotton Yarn.

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THE NOVELTY DYE WORKS,

WHITE & RUDY, Proprietors.

DYERS OF

WOOLEN, COTTON and MERINO HOSIERY YARNS,

Carpet Chain, Window Shade Cord, Drug Twine, any shade. Correspondence solicited.

Office, 212 Walnut Street, Second Floor, **CINCINNATI, OHIO**

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Dyers and Finishers,

COTTON YARNS, Suited for HOSIERY and WEAVING Cotton, Woolen and Worsted DRESS GOODS, Woolen and Worsted Mixed CASSIMERES and CLOAKINGS, also Woolen and Worsted Slubbing, COTTON YARN and WARP DYERS and BLEACHERS.

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WORKS: **Taylor, Emerald and Adams St., Kensington, Philadelphia, Pa.**

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Of Pure Finish Shirtings, Sheetings, Canton Flannels and Filled Good. Also Silesias, Satteens, Corset Jeans, Cambrics, Sleeve Linings, Pocketings, Flanneletts, and all descriptions of Dyed Goods.

NAPPING A SPECIALTY.

Being equipped with the French and other Foreign and Domestic Napping Machines we are prepared to give any kind of Nap required, including the French FlannelFinish.

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GLOBE DYE AND BLEACH WORKS,

FRANKFORD, - - PHILADELPHIA.

Specialists in Cotton Warps and Skein Dyeing.

HOME BLEACH AND DYE WORKS,

PETER B. McMANUS, Proprietor.

Dyers and Bleachers of Cotton Yarns,

PAWTUCKET, R. I.

Pawtucket Dyeing & Bleaching Co.,

BLEACHERS AND DYERS OF

COTTON YARNS AND STOCKINET.

OFFICE WITH **BLODGETT & ORSWELL CO., Manufacturers of Glazed Yarns,**
28 BAYLEY ST. PAWTUCKET, R. I.

COHOES DYE WORKS,

COHOES, N. Y.

Dyers of Raw Cotton, Wool and Knit Goods.

Satisfaction Guaranteed.
Capacity 10,000 lbs. per day. Prompt Deliveries.

FAST COLORS

For Wool, Woolen and Cotton Yarn and Piece Goods Dyeing, and for Calico Printing

ALIZARINE RED, PASTE AND POWDER

Alizarine Blues, Oranges, Browns, Yellows, Maroon, Gray and Black.
Cœruleine, Galleine, Mythylene Grays.
Thionine Blues, Thionine Indigo, Solid Green and
PATENT BLUES (superseding Extracts of Indigo on account of fastness and color bloom) for Wool and Silk, Benzidine and Primuline Colors, Zinc Dust, Aniline Salts and Oil.

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ORIANNA BLEACH WORKS,

Bleachers of all kinds of Cotton Goods.
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of our popularity is no secret to our customers. Experience has taught them that we give them better work and better service than they can get elsewhere.

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Dyers of all kinds of Yarn and Cotton Warps,
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Hematine, Extracts of Dyewoods, Chemicals.

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Aniline Colors,
Dyewood Extracts,
Sumac and
Nutgall Extracts.

FAST COLORS for wool dyeing, one dip cotton colors, novelties and specialties for calico printing.

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DYE STUFFS

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Alizarine Black-Bayer

(DIAMOND BLACK.)

The Cheapest Fast Black for Wool.

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Rhodamines, Patented.

Alizarine Blacks, Patented.

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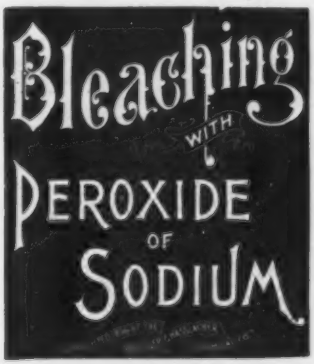

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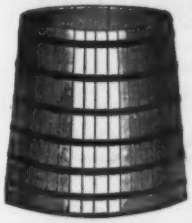

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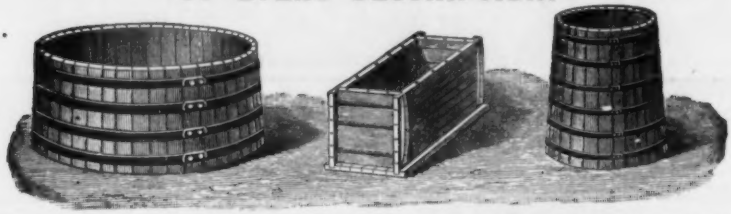

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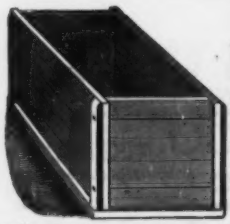

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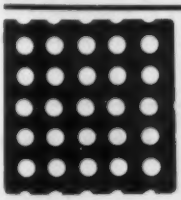

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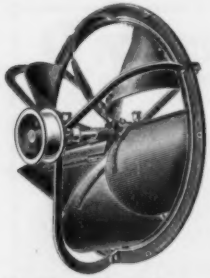

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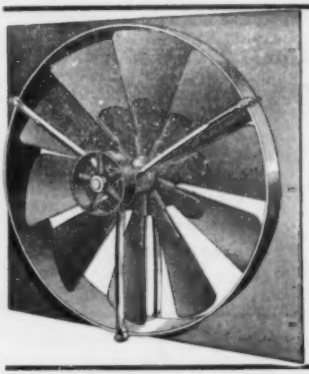

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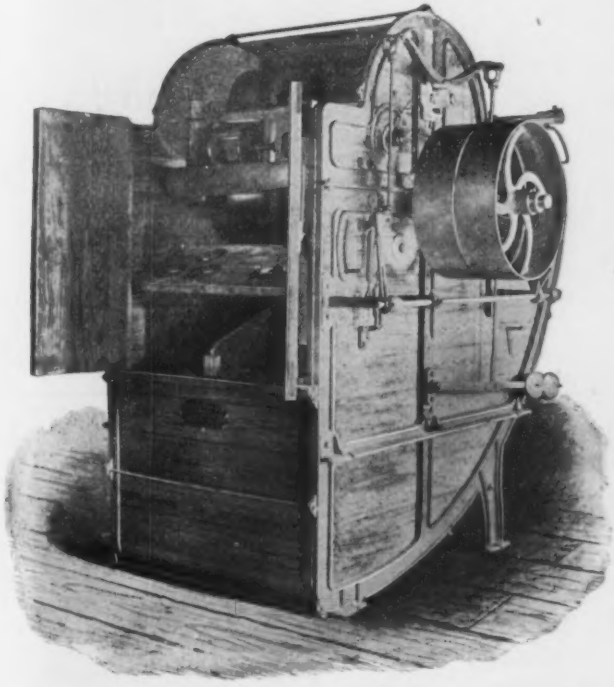

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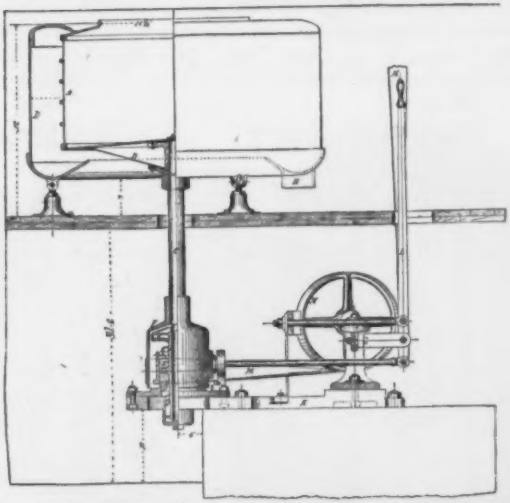

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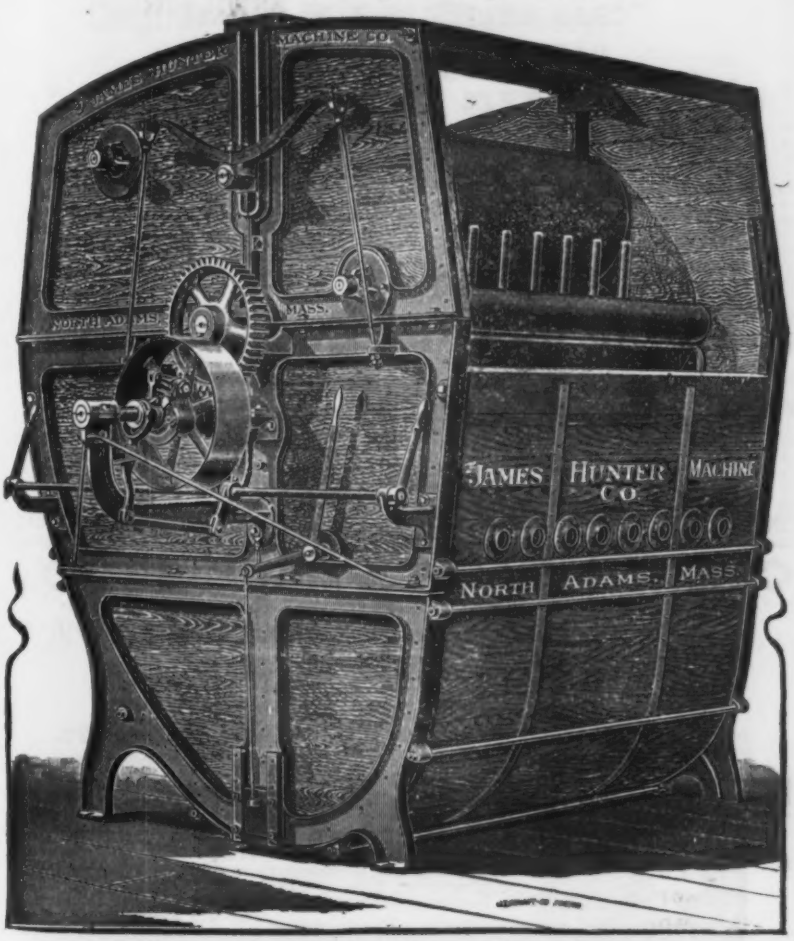

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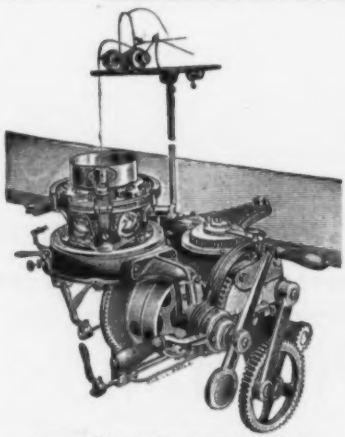

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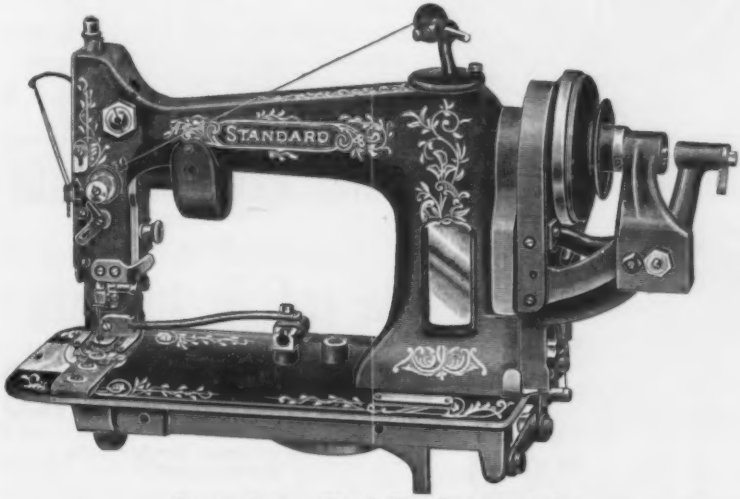

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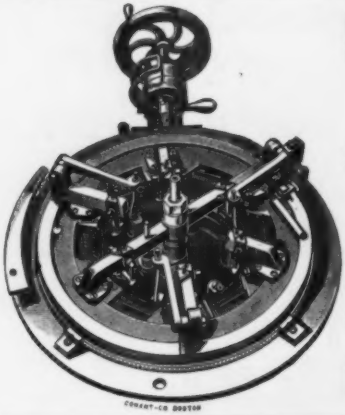

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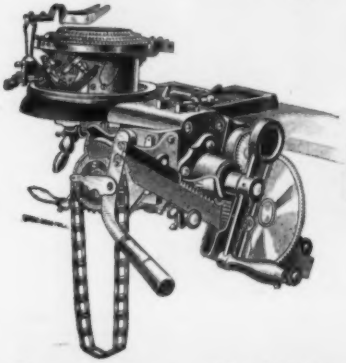

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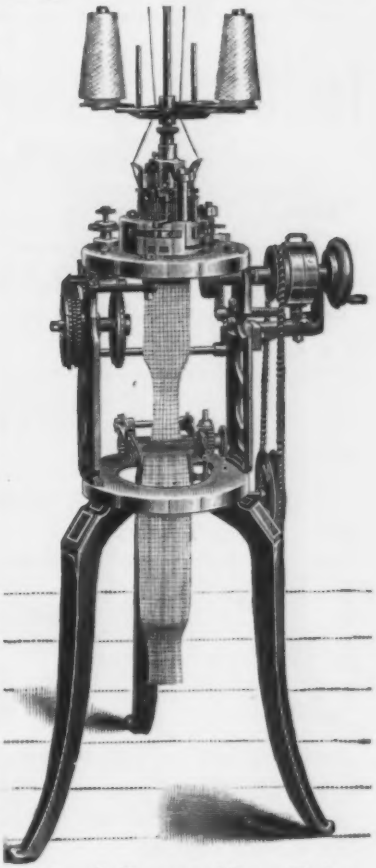

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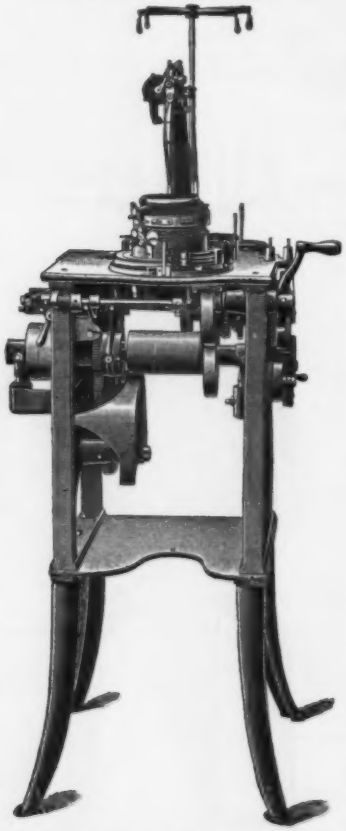

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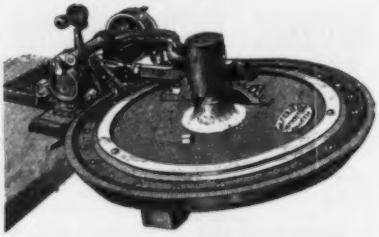

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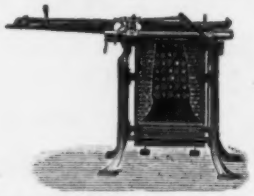

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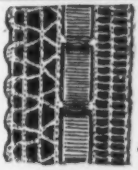

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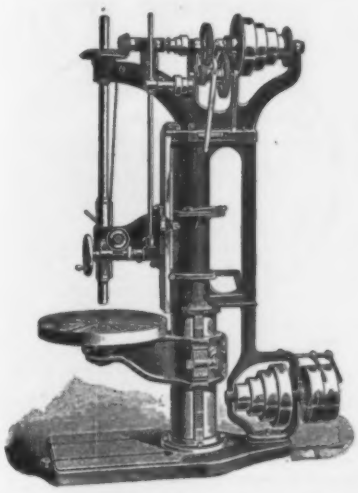

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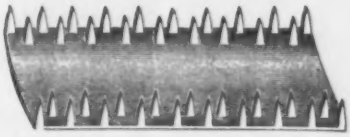

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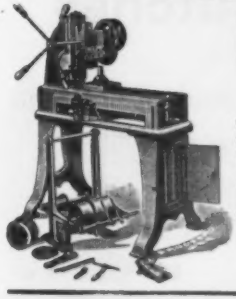

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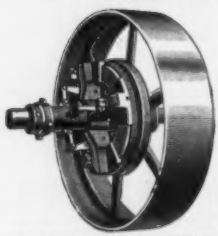

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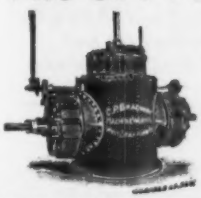

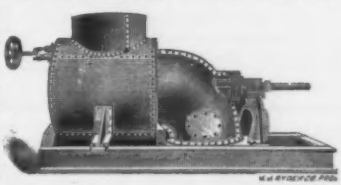

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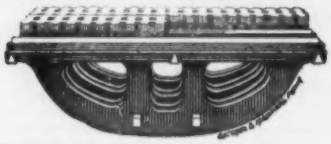

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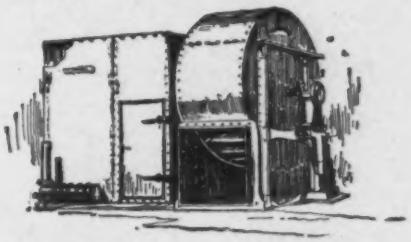

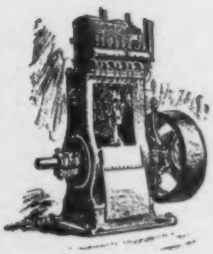

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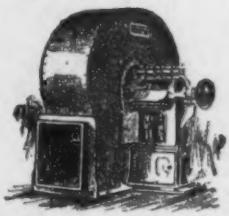

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